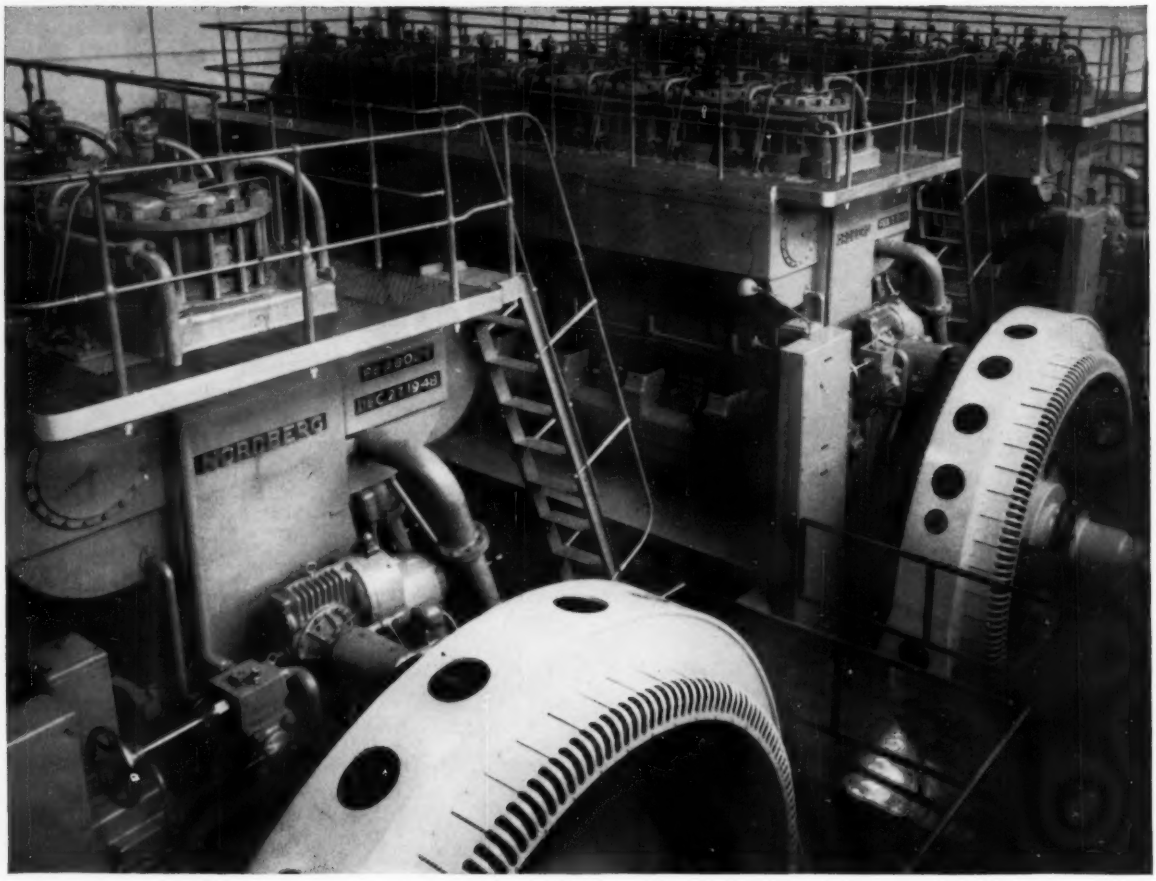
diesel power

October 1959

. . . for tomorrow's
light vehicles
Hercules has them now.

see page 18



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Texaco Ursa Oil prevents harmful deposits in diesel, gas and dual-fuel engines. It keeps rings and valves free for full compression and complete combustion . . . and it filters beautifully.

There is a complete line of Texaco Ursa Oils to meet the requirements of every diesel, gas and dual-fuel engine—regardless of make or model. A Texaco representative will be glad to suggest the one designed to keep your power output up, maintenance costs at a minimum.

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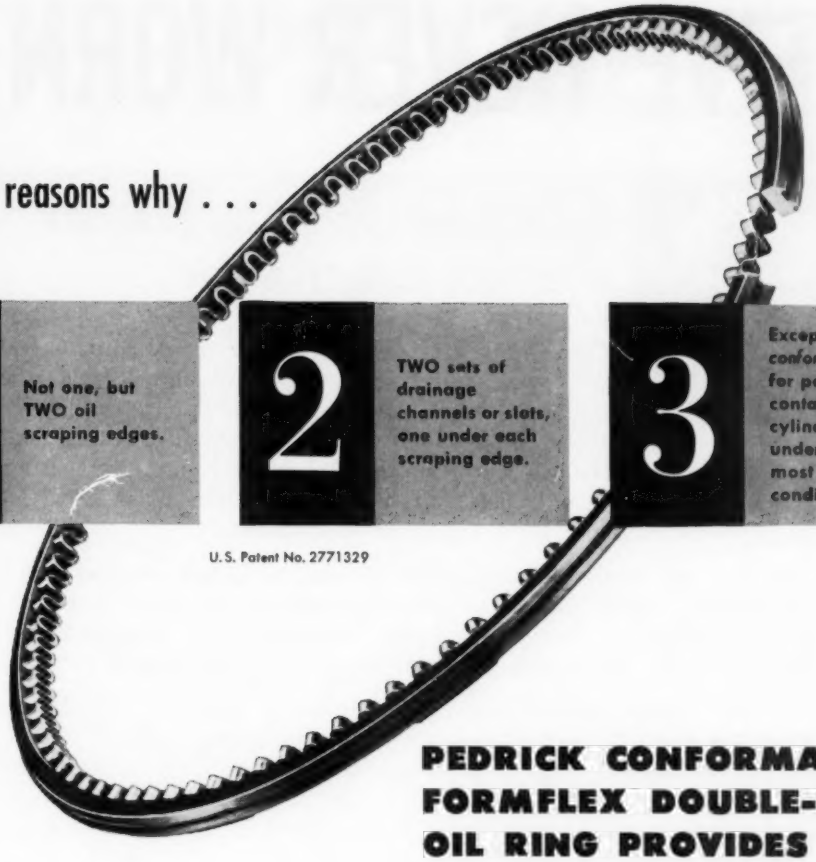
LUBRICATION IS A MAJOR FACTOR IN COST CONTROL
(PARTS, INVENTORY, PRODUCTION, DOWNTIME, MAINTENANCE)

3 good reasons why . . .



1 Not one, but TWO oil scraping edges.

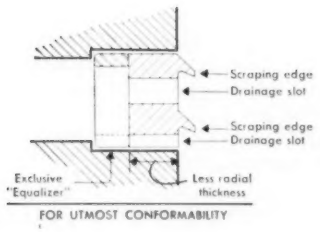
2 TWO sets of drainage channels or slots, one under each scraping edge.

3 Exceptional *conformability* for positive contact with the cylinder wall under even the most severe conditions.

U. S. Patent No. 2771329

PEDRICK CONFORMABLE FORMFLEX DOUBLE-DRAIN OIL RING PROVIDES IMPROVED OIL CONTROL

. . . especially on pistons with oil drainage through the grooves instead of below the grooves.



FOR UTMOST CONFORMABILITY

Users find the Pedrick FORMFLEX Double-Drain DD8 oil ring provides quicker, more effective drainage, giving improved performance in all piston groove designs. And they like its moderate cost . . . the way it installs without difficulty.

You can depend on its conformability. Pedrick's exclusive "Equalizer" steel expander ring exerts a uniform pressure all the way around the cast-iron cylinder-contacting ring. Radial thickness of the cast-iron ring is less, increasing its flexibility.

The DD8 Design Conformable FORMFLEX oil ring is just one of many designs available from Pedrick to help give you long-lived, dependable, low-cost engine operation. Say the word and our Engineering and Consulting Service are at your service. Write, wire or phone: WILKENING MANUFACTURING Co., Philadelphia 42, Pa., Tel.: SAratoga 9-3770. *In Canada:* Wilkening Manufacturing Co. (Canada) Ltd., Toronto 2.

Pedrick PISTON RINGS

PEDRICK PIONEERED *conformable* RINGS FOR BIG-BORE ENGINES

"WE'VE NEVER WORN OUT

Says C. Arthur Foss, who has 25 at work in the world-famous Foss Fleet

"Yes, sir, we have never worn out an Enterprise engine. We are still using the first one we ever bought, plus 24 others which power our tug boats," says C. Arthur Foss, Chairman of the Board, Foss Launch and Tug Company, Seattle and Tacoma. "We installed our first big Enterprise in 1937 in the *Anna Foss*. During the next 8 years, this engine ran 45,000 hours before being overhauled. Today it has run approximately 125,000 hours and is still going strong."

On the basis of the performance of its original Enterprise, the Foss Company and affiliates now operate 24 additional Enterprise Diesels – *3 times as many as any other make* – in its fleet. And these engines, which range from 200 to 1500 horsepower, are "turning in the same first rate performance!"

The Foss Fleet operates generally in the Pacific from the Equator to the Arctic Ocean, with extensive operations in the Pacific Northwest and Alaskan waters. Towing assignments range from railroad car ferries to oil and chemical barges, log rafts, sand, gravel and bulk cement barges, lumber and pulp chip cargoes. Other services include docking ships and participation in marine construction work of all kinds.

Top performance, such as the Foss Company gets from its Enterprise diesels, is available to you in any Enterprise model you select. So when you are considering a new engine, talk with your nearest Enterprise Marine Diesel Engineer. Models from 73 to 7703 H.P.

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engine & machinery co.

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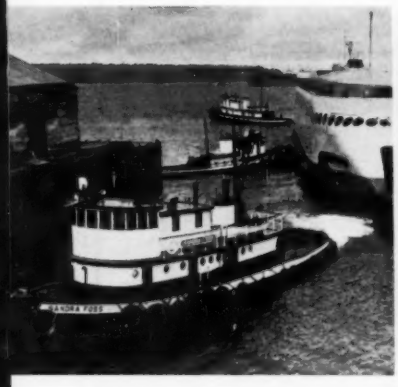
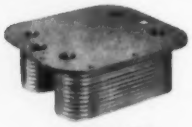
DEPENDABLE ENGINES

AN ENTERPRISE DIESEL!"

Seven of the Foss workboats powered by Enterprise Diesels line up for a family picture. Boats underway and at work are pictured below. The *Anna Foss*, in which the first Enterprise was installed, has already run 125,000 hours. (Far left below.) Total of 22 Foss boats are powered by 25 Enterprise Engines—3 times as many as any other make in this fleet.



SPECIAL DELIVERY!



Harrison Heat Exchangers —Reliable Products of General Motors Research and Engineering.

GENERAL MOTORS STAMPS OUT HEAT ON HARD-WORKING MAIL BOAT WITH RELIABLE HARRISON OIL COOLERS!

The mail must go through—and does—with Harrison on the job. The Westcott II, Great Lakes mail boat, delivers mail to an average of 73 ships a day . . . to 145 ships on a record-breaking day! This rugged 24-hour duty in all kinds of weather calls for reliable performance. And Harrison has been selected to cool the engine oil on this diesel-driven postman. Harrison—with a half century of experience in the heat-control field—assures you of top-quality products that are researched and engineered to control vital temperatures with maximum efficiency. That's why you'll find Harrison heat exchangers in every line of defense . . . in every line of industry. If you have a cooling problem, rely on Harrison for the answer.

GM HARRISON

TEMPERATURES MADE TO ORDER

AIRCRAFT, AUTOMOTIVE, MARINE AND INDUSTRIAL HEAT EXCHANGERS

HARRISON RADIATOR DIVISION, GENERAL MOTORS CORPORATION, LOCKPORT, NEW YORK

editors notes...

You'll want to read about...

The quickening pulse of a fast growing industry . . . you can keep up with new applications, new products, new ideas. Diesel Power's editors travelled thousands of miles during the past month to put this issue together for you . . .

A special report on Hercules new engine line . . . 11 new engines designed specifically for light and medium commercial vehicles . . . with a big hook "the price is right". We talk about prices, engine specifications and a market awareness that means Hercules is on the move . . . 4 pages beginning on page 18 . . .

High quality hydraulic governors for today's high-speed diesels . . . big or small, you can get accurate control for today's sophisticated power plants . . . how Curtiss-Wright's LE and M-2 units work, what they'll do and how you can put them to work (Pg. 23) . . . .

Toledo's new secondary sewage treatment facilities . . . a progress report on a vital civic problem solved by natural gas engines in a modern activated sludge-type installation . . . a growing market to keep in mind (Pg. 26) . . . .

You'll want to read about...

A report on GM's diesel taxicab . . . a story we are pretty excited about particularly since we've been pushing this application as a toe-hold into the light truck field. GM's entry into this field makes it "must" reading for everyone in the diesel industry . . . particularly if you know what a market of this size can do for diesel engine sales figures (Pg. 31) . . . .

Chicago ADS convention . . . this association is making real progress . . . proving its value to the industry, individual members, and the all important engine user. Study shows what this organization is doing, and how it is doing it in text and pictures beginning on page 38 . . . .

Today's Diesel Man is Merle Bogan of Smith's Transfer Corporation down in Staunton, Virginia. Mack diesels haul most of Smith's freight and Bogan's job is to keep them rolling. What makes him important? For one thing, he is part of a unique management concept . . . in the Smith company maintenance ranks level with operations . . . and there's more—it starts on page 42 . . . .

. . . and don't miss the departments — news of developments in the industry, new products, new ideas. The diesel-powered industries offer opportunity unlimited . . . are you getting your share?

ESTABLISHED IN 1923
OCTOBER, 1959 VOL. 37 NO. 10

diesel power

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BPA

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Your Local Supplier has a stock of specially priced Purolator Filters in Pur-Pack cartons. Call him today—or write for prices and complete information.

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Filter Line for fleets!

Purolator Oil Filters for Fleets are available in durable, money-saving Pur-Pack cartons—in the type you require, and the quantity you need.

ONTARIO, CANADA

"Purolator" and "Super-Micronic" Reg. U. S. Pat. Off.

More horsepower for the new Caterpillar D8 tractor

AIRESEARCH T-1404 TURBOCHARGER

Turbocharger system specifically designed for big Series H tractor

A joint development of Caterpillar and AiResearch, the turbocharger system is an integrated part of the new D8 Series H tractor. Extensive field tests showed an increase of 20% in bulldozing and a substantial gain in pushloading production with the Series H... brought about by the tractor's greater horsepower, faster torque rise, greater weight and faster dozing and reverse speeds.

Specifically designed to match the new tractor's requirements, the new turbocharger underwent thousands of test hours on the new D8 operating in every kind of material on every kind of job.

AiResearch turbocharger advantages include: increased horsepower, improved lugging ability, cooler exhaust temperatures, reduced maintenance costs, less smoking and noise. This is another application of AiResearch turbochargers to heavy industrial machinery.

THE GARRETT CORPORATION

AiResearch Industrial Division

9225 South Aviation Blvd., Los Angeles 45, California

DESIGNERS AND MANUFACTURERS OF TURBOCHARGERS AND SPECIALIZED INDUSTRIAL PRODUCTS

diesel power

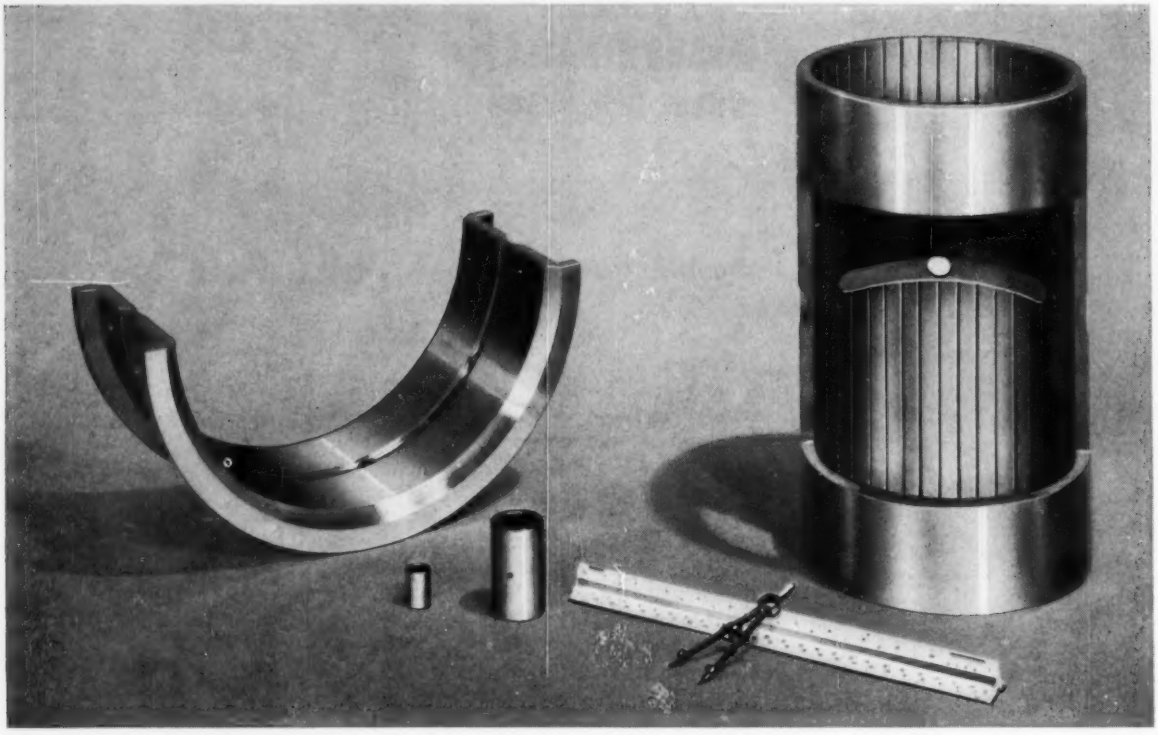
editorially speaking

Moving fast . . .

If there's any doubt in your mind that the diesel industry is moving fast, you should follow the editors around for a while. Some 5000 miles of travel and a lot of missed sleep went into this issue. Things are breaking fast and there seems to be no letup. It got so bad at one point that there was nobody home to mind the store. So what's happening? Fundamentally, it's the state of our economy. An economist might explain that while production was high and gross income at its highest, the percentage of profit to gross income is narrowing. The average businessman would say that in order to make a buck he had to find ways to cut costs . . . produce for less. In primary industries where a lot of prime movers are used — construction, all fields of transportation and in production of raw materials — this means diesels. Some of these are traditional diesel markets but with both larger and smaller engines available, broad new marketing areas are being opened. You know many of them; we've told you about them in past issues. Now this thing is snowballing and the diesel industry is getting into the big leagues.

For one thing, we've got the automotive Big Three in the act. And just as some American firms saw opportunity to build and sell their engines abroad, foreign manufacturers have moved into segments of the American market, particularly the area of small diesels. Today, its getting to be a hot race to fill the grassroots demand and get established in these new markets, some of which dwarf more traditional ones. Anyone that stands still now has had it. And that includes us too. We've had to move fast to keep on top of today's rapidly-changing diesel picture. We've done it too. Good trade journalism is a full-time, specialized field. On-the-spot reports, interpretive and creative writing, photojournalism . . . are all tools of the trade. There are five examples of this type of journalism in this issue. Then look at the spearheading of the taxicab thing . . . and light truck dieselization. We're seeing results. So go ahead, industry, move as fast as you want, we'll stay with you. We knew it had to come, in fact predicted it, and helped it along.

B. P. E.



Big or small, Johnson cast bronze bearings lick the tough jobs

BIG or small, Johnson Bearings, plain, grooved or designed for solid lubricants—up to 30-inch lengths—are precision-designed to give trouble-free performance, plus long life in demanding applications where heavy duty is a factor . . . or where . . .

- **it may be difficult to lubricate or lubrication may be neglected.**
- **high temperatures may rule out ordinary oils or greases.**
- **temperatures are too high or speeds are too slow to sustain an oil film.**

Available plain, with oil grooves, plug type or serrated type graphite, these tough Johnson bearings can be custom-made easily for rigorous applications. Serrated types are available from stock in more than 175 sizes; plain bearings in more than 900 stock sizes. For special applications *twenty-five* quality Johnson alloys are yours to choose from to assure the inherent quality of these bearings—plain or flanged.

To get the bearing you need for an economical investment, call, write or wire Johnson Bronze Co., 470 South Mill Street, New Castle, Pa. Do it today.

Johnson Bronze

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JOHNSON Bearings

POWDER METALLURGY—BRONZE OR IRON

ALUMINUM ON STEEL SOLID ALUMINUM

BRONZE ON STEEL

STEEL AND BABBITT

GRAPHITED BRONZE

BRONZE—CAST OR ROLLED

diesel power news section highlights

TAXES POINT UP SWING TO DIESEL

Half of every dollar's worth of gas you buy in many states now goes for federal-state taxes . . . on a nation-wide average, taxes have hit a 47% level according to the American Petroleum Institute. Sure, diesel fuel cost, with all the taxes added, keeps pace with gasoline but you use less of it. While the percentage you save remains the same it is applied to a rising cost figure so you save more money per gallon. These additional savings pay off initial engine cost that much faster and thus broaden the range of economically-feasible diesel applications. Like in short-haul, light-load service.

FPC CONSIDERING NEW JET-POWERED COMPRESSOR STATION

Columbia-Gulf Transmission Company has filed plans for construction of a new compressor station incorporating the new jet-powered Cooper-Bessemer gas turbine. Station will be at Clementsville, Kentucky and will provide 10,500 compressor hp for extensive test and study. New type gas turbine is being developed jointly by Cooper-Bessemer and Pratt & Whitney Aircraft. It utilizes a J-57 jet aircraft engine, with natural gas as fuel, to drive a specially designed Cooper-Bessemer power turbine and centrifugal compressor.

NATURAL GAS INDUSTRY PROGRESSES

Federal Power Commission issued 198 certificates during 1959 fiscal year authorizing some 614,000 horsepower in compressor units. Estimated cost of the facilities, $763,037,000, is the largest amount in any fiscal year since certificate provisions of the Natural Gas Act became effective in 1942. In that seventeen and one-half years FPC has authorized some 85,000 miles of pipeline and more than 6,035,000 horsepower.

GENERAL MOTORS RECEIVES HENDERSON MEDAL FOR DIESEL-ELECTRIC LOCOMOTIVE DEVELOPMENT

The Franklin Institute has awarded the Electric-Motive Division of General Motors the George R. Henderson Medal. "For the Conception and demonstration of the feasibility of utilizing diesel-electric locomotives on a wide scale in this country and for the design, development, standardization, producing and servicing of these locomotives," reads the citation.

AMERICAN MARC TAKING STRIDES IN DIESEL FIELD

California manufacturer of small, lightweight diesels, generators, engine-generator sets, announced a complete line of diesel powered marine pleasure craft . . . this includes boats powered by the firm's new outboard diesel which goes into production in January 1960. Also announced — listing on the American Stock Exchange.

MORE NEWS HIGHLIGHTS FOLLOW ►

NEWS SECTION HIGHLIGHTS . . .

PROGRESS WITH SYNTHETIC LUBES FOR HIGH TEMPERATURE APPLICATIONS

Pentalube TP653, new "ultra-stable" synthetic lubricant developed by Heyden Newport Chemical is being supplied to the Air Force for continued test and development in high temperature applications. It has already operated at 425°F for 100 hours and has effectively lubricated internal parts at close to 500°F. Automotive people are getting a crack at this synthetic high-temperature oil and other commercial uses are being explored.

WATER-FINDING PILL FOR FUEL TESTING DEVEVLOPED

Esso Research has a pill that is reported able to find a thimblefull of water in hundreds of gallons of fuel. Product is called Hydrokit and was developed for use in jet fuel, where water in fuel can freeze at high altitudes and clog orifices. Capsule can be dissolved in small quantity of fuel and if fuel turns pink or purple it is unsafe. Hydrokit could have applications in diesel field such as water detection at fuel storage facilities.

COOPER-BESSEMER BUILDING RESEARCH AND DEVELOPMENT CENTER

Ground has been broken for Cooper-Bessemer's new research and development building designed to expand the company's line of new products. New facilities will cost about $250,000 and should be completed in February 1960. A second project of similar size will be added late in 60 or early 1961.

NEW APPLICATIONS SPARK FAIRBANKS-MORSE UPSWING

Orders for diesel engines are up 96 per cent over 1958 at F-M. Research developed new fields for diesels, according to company announcement by president Robert Kerr. Equipment for refueling missiles in the field is one . . . others are still to be reported. Earnings for first six months of this year were $.84 per share.

HEAVY CONSTRUCTION CONTRACTS HIT RECORD IN JULY

So far this year that industry has a big $12.8 billion for new construction tallied . . . but July highway contracts slipped 11 per cent under last month and last year. Not good. This is a big area for diesel equipment and important for our industry as well as the country in general. All the more reason for federal action . . . write, wire or phone your representatives in Washington and let them know where you stand and we'll get action.

PERFECT CIRCLE REPORT POINTS TO HEALTH OF REPLACEMENT MARKET

In addition to the announcement that sales are running way ahead of forecasts for entire Perfect Circle product line, firm reports that sales of replacement items have shown substantial gains. For first five months of this year sales were about 33 per cent ahead of same 1958 period and volume is currently running at a $40 million rate . . . all part of a general pattern reported in the industry that spells more engines at work, working harder and longer.

MORE INDUSTRY NEWS FOLLOWS ►

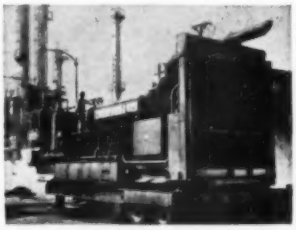
BENDIX FUEL INJECTION FEEDS LARGEST TRAILER-MOUNTED POWER PLANT

Rugged operating conditions demand utterly reliable performance. That's why the world's largest trailer-mounted mobile power plant, developed by White Diesel Engine Division for the government of Venezuela, is equipped with Bendix* Diesel Fuel Injection equipment.

The 1250 KW unit was designed by White for use as a weatherproof all-in-one power source on major construction projects. Mounted on a 39-foot trailer, the huge plant provides maximum power in a minimum package. Its fabricated steel engine drives a 12-ton generator and is equipped with an 11-foot cooling radiator.

First task of the new power plant will be to provide the power for construction of a 335-million-dollar, 750-acre petrochemical installation in Venezuela, encompassing more than 20 factory buildings. The entire area is being reclaimed from tropical forest and swamp.

Extreme conditions call for superior equipment. White specified Bendix Diesel Fuel Injection equipment.



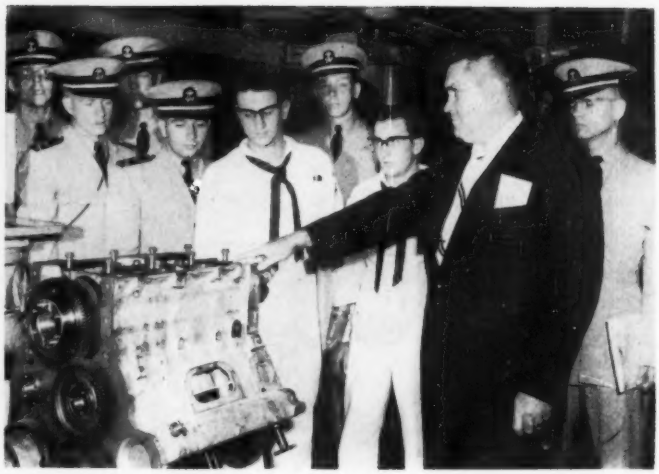
When the plant is in position, the Autocar truck can be detached for other uses and the 16-wheel trailer leveled to provide a proper operating base.

* REG. U.S. PAT. OFF.

Scintilla Division
SIDNEY, NEW YORK

Bendix
AVIATION CORPORATION

Export Sales & Service: Bendix International Division, 205 E. 42nd St., N.Y. 17, N.Y.

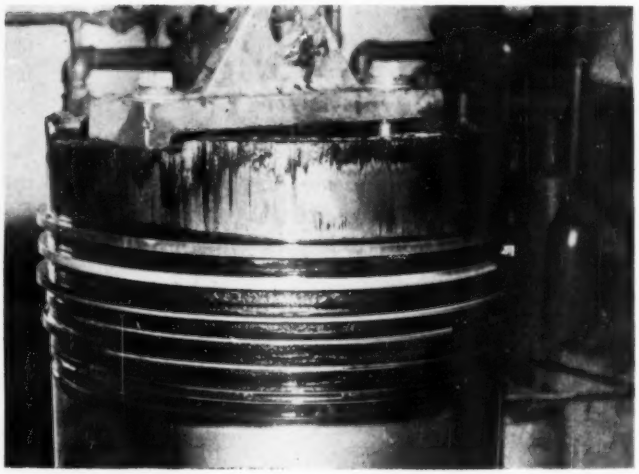


Detroit Diesel welcomed group of officers and men of U. S Navy as St. Lawrence Seaway brings Navy vessels to Detroit. Here, midshipmen of the U. S. Naval Academy and enlisted men view assembly of new vee-diesel at General Motors Detroit Diesel plant. First hand look at late developments in diesel industry promotes interest and engine knowledge for these men.

diesel power news section

Mack Trucks receives two awards . . . here, Governor of Pennsylvania David L. Lawrence, on the left, presents Elliott G. Ewell, executive vice president-sales, his state's safety award for meritorious service to highway traffic safety. At the same time, Mack received the Public Interest Award of the National Safety Council.

Smyrna Beach, Fla. municipal power plant is proving that wear need not be excessive when Bunker "C" fuel is used. After 25,000 hours, they took a turbocharged Enterprise DSR-38 down. Maximum liner wear was only 0.001-in. and maximum piston wear only 0.002-in. Two top chrome-plated rings were in excellent condition. Oil control rings in all pistons were found to be in good shape and free from fouling. Koppers rings were used in this engine.



NEWS ABOUT PLACES, PEOPLE AND PLANTS FOLLOWS ►

NEWS SECTION . . .

Aluminum Industry and Progress Go Hand-in-hand . . .

Called the most versatile of metals, aluminum has invaded almost every phase of the diesel industry. GMC's new lightweight highway tractor now in production, powered by their new V6 "Jimmy" diesel, features a 696 lb aluminum tilt-cab. There is more useable space for the driver in this 48 in. cab than in some 72 and 90-in. dimension cabs. Weight saving is the key to the new GMC model DFR-8000. Truckers can load an extra ton of cargo and still be within the 61,-000 lb gvw rating.

Railroads are coming in for their share of aluminum's advantages. Diesel locomotives will have strings of bright aluminum covered hopper cars and gondolas behind them on the Southern Railway System.

Reynolds Metals has announced a contract to supply aluminum for the production of 1205 such cars. This is considered a major break through in the railroad industry.

Federal Mogul Building New Plant To Produce Cooper-Lead Alloys

This new facility will produce Federal Mogul's patented copper-lead bearing powders by a water-jet atomizing process. Specially designed atomizing equipment will produce a copper-lead bearing powder in which purity, uniformity, low oxide content and high apparent density all contribute to easy machinability. In use, the powder is bonded to a steel backing and resulting coil of bimetal strip is then coldformed into bearings and bushings on multiple-stage dies.

New plant will expand facilities already working at capacity.

Hydraulic Track Adjusters Ease Adjustment on 3 Cat Crawlers

Previously introduced on Caterpillar's three largest track-type tractors, the new adjusters permit track tensioning with a standard hand operated grease gun. They replace the former bolt-and-wrench system. Adjusters are now available as attachments for the Caterpillar D4 and D6 Tractors and 977 Traxcavators.

Benefits to the user are prolonged track life as new, easier method encourages operators to correct track tension at proper intervals.

Snap-on®

Electric IMPACT WRENCH

You Handle All These Jobs FASTER...EASIER

- Tighten and loosen nuts up to 90% faster than by hand
- Turn most pullers
- Drive and remove screws, lag bolts
- Remove and replace studs
- Remove carbon, scale, rust, paint
- Drill and ream holes
- Tap threads
- Many other jobs

This SNAP-ON electric impact wrench is one of the handiest tools in the shop. It works so fast and easy your men can turn out double and triple the work without even thinking about it.

There's extra safety, too, in an impact wrench. A man can get up on a ladder or work in awkward positions without fighting the side thrust of a regular electric tool. Also, on drill or other work it won't burn out if the attachment gets stuck.

The tool's one-half inch square drive takes sockets 3/8 to 1-1/16 in. — many accessory tools available. Two models — 115 volts, 220/230 volts. Tool is top quality throughout — has many construction advantages. Get full details from your SNAP-ON representative. Factory branch warehouses in principal industrial centers. Or write us.

SNAP-ON TOOLS
CORPORATION
8064-J 28th Avenue • Kenosha, Wisconsin

NEWS SECTION . . .

Dieselized Landscape Grading

Six Ford diesel tractors make quick work of levelling around newly constructed homes. Contractor R. Q. Mills of Pasadena, Texas performs this service for his 125 building contractor clients.

Mills operates in 10 counties around Houston. He has enough work lined up for the purchase of at least two more tractors.

His method of operation goes like this. As soon as one of the contractors has a block of around 20 houses ready, Mills moves in his equipment. If he can get an early morning start, he can often finish the job by early afternoon. Then he's off to the next job.

Contractor Mills reports that his Ford 851 diesels give him good performance and more importantly—economy. These tractors will use only about $1.75 worth of fuel per day!

Rubber-like Synthetic

Scientific research moves ahead with a swiftness that makes keeping up almost impossible. But where developments apply to our industry, or have possible application, we try to report them.

Synthetic oils (see Highlights) are getting a big play . . . so are the urethanes. One rubber-like synthetic called Daycollan, made by the Dayton Rubber Company, has demonstrated some amazing physical properties.

A thin layer of cast urethane between two metal sleeves creates a drive shaft torsion elastic spring that will transmit full engine torque, (tried on automotive engines), yet dampen vibration and cushion shock. In repeated tests metal broke down before the Daycollan would shear.

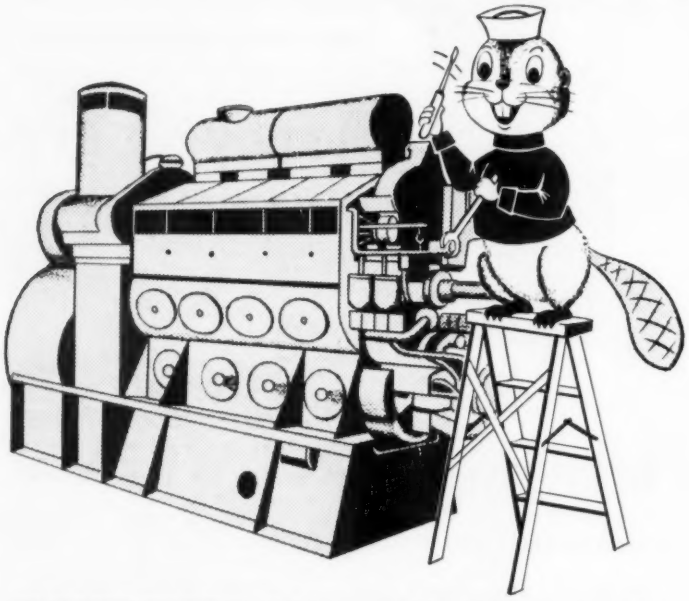
And there are a variety of interesting applications for this new material. It is now being tested in plastic-like foam to fill tires. This could be an exciting development if tests continue to show promising results already obtained.

ATA Views on Postal Transportation Problem

Serious problem of postal transportation can be met by combined service of all common carriers, air, rail and motor. This is the contention of the American Trucking Association.

Mail transportation by truck is only now being seriously considered with legislation pending to make it possible. While the Postmaster is urging legislation to permit air transport of all classes of mail, on the basis of "impracticability or inadequacy of surface transportation," fact is that truck service reaches into more areas with greater frequency than any other mode of transportation. Its about time that postal officials took a hard look at the job the trucking industry could do in moving mails.

It might be well to keep in mind the fact that service is so slow in some areas now that truckers are using their own facilities to transmit intra-company mail!



SAVE TIME AND MONEY... LET NATIONAL MARINE KEEP YOUR DIESEL ENGINES, PUMPS AND COMPRESSORS ON THE JOB!

For annual maintenance and overhaul of your diesel engines, compressors and pumps, count on National Marine. We'll rush trained experts and replacement parts to the scene . . . by air, if necessary. You'll get urgently needed productive equipment back in service with a minimum of down-time, and yearly maintenance costs will stay at rock bottom. Call, write or wire for full information on our maintenance and repair service.

ENGINEERING SALES AND SERVICE DEPARTMENT
NATIONAL MARINE SERVICE, INC.
800 DELMAR AVENUE • HARTFORD, ILLINOIS
Telephone: (St. Louis) CHestnut 1-6358
General Offices: 21 West Street, New York 6, N. Y.
MEMBER OF THE AMERICAN WATERWAYS OPERATORS, INC.

Nelson C. Dezendorf

Richard L. Terrell

Organizational Changes at General Motors

Recently announced changes at GM include the election of Cyrus R. Osborn to Executive Vice President with jurisdiction over the Engine Divisions; Electro-Motive group plus the Dayton, Household Appliance, Overseas and Canadian group.

Nelson C. Dezendorf was elected member of the Board of Directors. He will be Vice President in charge of Electro-Motive, Dayton, Household Appliance and will also serve on the Executive and Administration Committees.

Richard L. Terrell was elected a Vice President of GM and was appointed to succeed Mr. Dezendorf as General Manager of the Electro-Motive Division.

A series of organizational changes within Electro-Motive Division was also announced. William H. Harvey was appointed to the newly created position of Director of Production. B. B. Brownell moves into the newly created post of Director of Engineering and research. Thomas B. Dilworth succeeds Mr. Brownell as Chief Engineer.

Anthony A. Brooks

Walter S. Dack

C.A.V. Service Manager Appointed

Signaling the extent of C.A.V.'s penetration into the American market with their fuel injection equipment is announcement of appointment of Anthony A. Brooks as service manager. Announcement was made by Walter S. Dack, vice president, C.A.V., Ltd., Cleveland, Ohio.

Mr. Brooks, with C.A.V. since 1945, brings to this job the thorough technical and practical training characteristic of so many British engineers. He served a seven-year apprenticeship with British Thompson

(*Continued on page 52*)

REDUCE LAPPING TIME TO A *Minimum* ON

Diesel Injector and Compressor Parts

LAPMASTER Model 10

Consistently laps to flatness within .0000116" and finishes of 2 to 3 RMS.

No down time for truing lap plate . . . conditioning rings automatically keep plate flat and true.

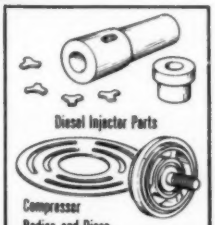
Handles parts up to 7" dia. . . . any shape or form . . . any metal, ceramics or plastic.

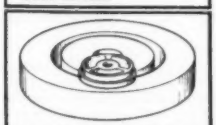
Automatically controlled lapping cycle.

Write for latest Lapmaster Bulletins

CRANE PACKING COMPANY

6448 Oakton Street, Morton Grove, Illinois, (Chicago Suburb)
In Canada: Crane Packing Co., Ltd., Hamilton, Ont.





Grooved lap plate permits lapping of compressor bodies without removing stud.

KIENE® DIESEL PRESSURE INDICATOR

gives compression and firing pressures faster

SIMPLE
RELIABLE
COMPACT

Send for Bulletin K-100

The Model K-100 Kiene Pressure Indicator accurately measures compression and firing pressures — assures the proper maintenance of diesel engines — helps prevent costly down time. Only one moving part — no friction or inertia effects — no complicated adjustments.

KIENE DIESEL ACCESSORIES, INC.
10352 PACIFIC AVE., FRANKLIN PARK, ILLINOIS

Hercules' New Engine Line

President Pringle introducing new engines.

. . . aimed at light and medium truck use, small, light, low-cost diesels from 50 to 350 horsepower, some with multifuel capability, were specially designed for this application.

SPECIAL REPORT BY DIESEL POWER

TWO things have retarded diesel application in light and medium commercial vehicles. First, lack of engines especially-designed for such applications having suitable power, weights, sizes and speeds. Second, engines with a low-enough price tag to make such application economically sound. We've got the answer in our new line of diesels.

"We expect that this new line—light, short, flexible in application and particularly important, carrying a low price tag—will create a whole new market for Hercules diesels."

These are remarks by Hercules President William L. Pringle at the Canton, Ohio plant when the whole line was both introduced and demonstrated. Talking with key executives made one point crystal-clear—they believe in this market and that their products will meet its needs.

They are going after the commercial vehicle field from taxicabs up to trucks of 55,000 lb GCW, both as original equipment and for repowering. At the same time, other logical applications for these diesels are not going to be slighted. They are equally well suited for powering materials handling equipment, farm tractors and other farm implements, construction machinery, vessels and a wide variety of industrial equipment. And don't forget the Military.

But a prime target will be the commercial vehicular field. Let's see what they have for ammunition.

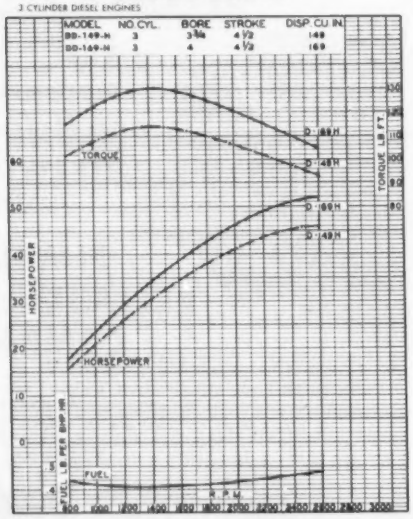
There's really two lines . . .

In all we're talking about 11 engines, seven with direct-injection combustion chambers and four with a new turbulence chamber combustion system. The latter are "Polydiesels" with multi-fuel capability. Some data on the whole line is given in the table.

Both lines (we've arbitrarily separated them based on type of combustion chamber) are "hot" but for somewhat different reasons. For example, the direct-

POWER CHART

3 CYLINDER DIESEL ENGINES



The above curves show the performance of a standard stripped engine as developed on an electric Dynamometer, corrected to 29.92" sea level barometer and 60° Fahrenheit temperature, and show the power delivered at the flywheel without fan or other power consuming accessories.

Direct-Injection Engines

Model	Cyl.	Bore-Stroke	Hp.	RPM	Length	Width	Height	Weight
DD-149-H	3	3¾-4½	46	2600	27	23	33	580
DD-169-H	3	4 -4½	52	2600	27	23	33	580
DD-198-H	4	3¾-4½	72	2600	32	23	32	630
DD-226-H	4	4 -4½	78	2600	32	23	32	630
D-298-H	6	3¾-4½	114	3000	41	24	33	785
D-339-H	6	4 -4½	120	3000	41	24	33	785
D-298-HT	6	3¾-4½	150	3000	48	27	35	830

Turbulence-Chamber Polydiesels

D-426	6	4¼-5	145	2600	45	25	38	1350
D-426-T	6	4¼-5	180	2600	45	28	43	1450
DV8-662	8	4¾-4¾	200	2600	53	45	30	1540
DV8-662-T	8	4¾-4¾	260	2800	53	45	—	——

Note: Compilation was made by DIESEL POWER and is approximate with respect to horsepowers, dimensions and weights. Dimensions are to the next largest inch for fan-to-flywheel models. Weights are for stripped engine. Ratings given Polydiesels are approximate and based on "Standard Diesel". Horsepower will vary with the fuel used, application. Much higher ratings can be obtained with increased fuel settings.

injection engines are excellently suited to vehicular application in the 3000 to 24,000 GVW classes.

The horsepower spread, sizes and weights permits rating and selection to suit both the power requirements and the physical needs of a given application.

The larger line picks up where the other leaves off and provides ample power for both on and off-highway equipment. Its multi-fuel capability is proving of extreme interest to the Military since its ability to use any of the common military fuels—gasoline, kerosene, JP jet fuels, plus Diesel Nos. 1 and 2—simplifies logistical problems. This feature will also apply in many commercial applications where maintaining a consistant fuel supply is difficult.

Direct-injection models . . .

The seven engines involved represent a new line and are not to be confused with earlier DD models. However, it would be surprising if Hercules did not use proven ideas and features from earlier developments. One major idea, use of a common block for gasoline and diesel models, has a major effect on costs.

Mr. A. E. Bigelow, Assistant to the President, explained it this way. Three basic blocks had been developed for the 3-, 4- and 6-cyl diesel models. Each block had provision for two bore sizes, 3¾ and 4-inches. Crankshafts were designed for diesel loads and a stroke of 4½-in. was standardized for all models.

These three blocks and crankshafts, used for both diesel and gasoline versions, serve for six gasoline engines and the seven diesels. This multiple-use principle is applied to every single part that can be made common. High production runs help to reduce individual part cost.

In the seven diesels, a single stroke and only two bore sizes are used. Bearings and connecting rods are all the same and only two piston and ring sizes are needed. Again, multiple use of parts increases production runs. In addition to initial cost savings, this broad interchangeability feature simplifies the parts pipeline and reduces inventory requirements at all levels from factory to user.

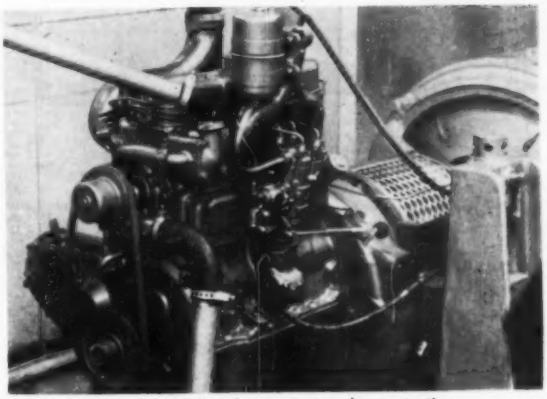
Mr. Pringle mentioned a "low price tag" and we've been discussing other features that affect costs. What does it all add up to? We asked Mr. William F. Humphrey, Director of Sales, for some idea. He explained that Hercules is in process of publishing price lists for the new line but that as an example, distributor list price on the 115-hp 6-cyl, 3000-rpm engine is about $1,400. List for the 50-hp 3-cyl engine is about $950. Looks like we're getting somewhere.

Construction features and performance . . .

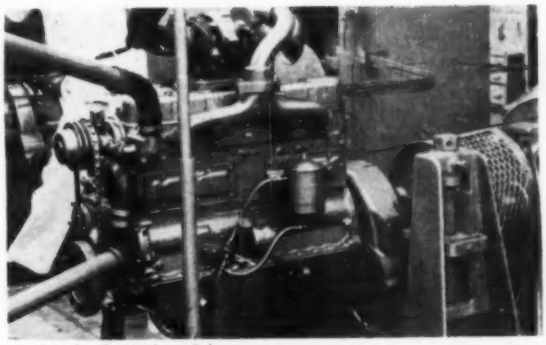
General construction features are the same for all the direct-injection models. Block and crankcase are made integrally of cast iron. Special alloy, precision-type dry sleeves are available for all the 3¾-in. bore engines.

Crankshafts are all of special steel, surface hardened. Journals and pins are the same size for all engines. A main bearing is provided between each crank throw.

New 4-cyl engine in Checker cab chassis.

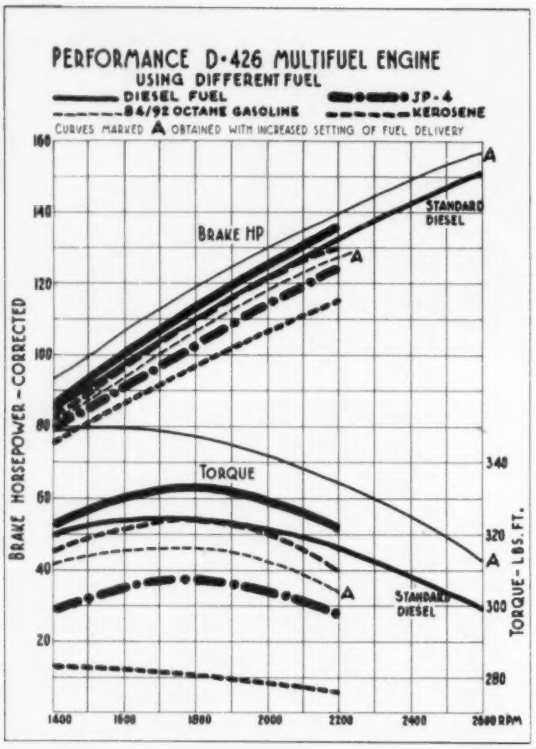


Same engine mounted for dynamometer demonstration.



6-cyl turbocharged model . . .

Early applications represent 3 potential markets.



Front, rear, center and intermediate main bearings are the same for all engines. All connecting rod bearings and connecting rods are the same too. Two sizes of heat-treated aluminum alloy pistons with full-floating piston pins are used. Selection depending on bore size.

Single-casting cylinder heads are used. These incorporate the rocker arm mechanism and the hi-alloy forged valves. Space is provided for the multi-hole nozzles that enter the combustion space at a slight angle off vertical.

A modified "Mexican hat" type combustion chamber is located in the piston head. Its design, plus that of the air passages, provides for both swirl and squish. The result is a high degree of turbulence. Fuel is supplied by a distributor-type pump to the nozzles. Flange mounting with drive from the timing train is used on the automotive models.

An AiResearch turbocharger is used on the 6-cyl turbocharged model. The exhaust manifold is made in three pieces with expansion joints to avoid stresses on either head or manifold during thermal expansion or contraction.

As for performance, a chart has been selected to show the pattern of results obtained. Note particularly the shape of the torque curve and location of the peak. There is good torque backup with decrease in rpm and maximum torque is available at the engine speed range where these engines, considering the projected application, will be working a lot of the time.

On the dynamometer, all engines were cycled through their full power range with a clean exhaust. Idle was smooth at 500 rpm, the low setting on these engines at the time. The 3- and 4-cyl engines were surprisingly smooth at all speeds/loads including idle.

Three typical applications were on display. The 3-cyl engine fitted nicely in a fork-lift truck; the 4-cyl engine was installed in a Checker chassis; and the 6-cyl normally-aspirated engine was an easy fit in a truck in the 22,000-lb class. The cab will soon be in operation in metropolitan taxi service.

In addition to the modest dimensions and weights of these engines, an added feature increases applicational flexibility. All blocks are symmetrical. Intake manifold and fuel injection equipment can thus be on the right or left-hand side as desired, with the exhaust manifold on the opposite side.

Now, "Polydiesel" models . . .

The combustion system is the heart of the four multi-fuel models. Starting several years ago, Hercules began a co-operative program with Hispano-Suiza of France. The outcome: present turbulence chamber.

The general configuration is illustrated. Note particularly the plate called a "vaporizer insert" that forms the lower half of the chamber. Dr. Horiak, Director of Engineering, explained that not only was its shape and the general configuration of the chamber important, but that its metallurgy had a unique effect.

While hesitating to use the word "catalytic," he said that certain results were obtained with this particular alloy that could not be met by others even though they had the required structural and thermal strength. In any case the combustion system has given the engine remarkable capabilities.

Performance of the 6-cyl in-line engine and the turbocharged vee-8 engine was demonstrated on diesel fuel, kerosene, JP-4 fuel and gasoline of 82 motor and 92 research octane rating. In switching from one fuel to another, there were only two indications of a fuel change. Horsepower output is somewhat reduced with the lower specific weight fuels and on a switch from diesel fuel to gasoline, the engine sounds entirely different.

Noise level appeared somewhat higher when running on gasoline or at least the pitch of the combustion noise was in a higher key and sounded louder.

This sound difference is only an indication of the fuel being burned; don't get the idea that the engines are noisy. Quite the contrary, the level is very low and "soft" with an absolute minimum of diesel knock.

Multi-fuel capability has tremendous appeal to the Military and in some commercial applications. In addition, this combustion system provides advantages for general useage. For one, it produces specific fuel consumption in the range normally credited only to direct-injection engines. This is done with the pintle-type nozzle, noted for its long service without cleaning, while maintaining good performance and economy.

During performance runs, the engines gave smoke-free performance throughout their load-speed ranges. No adjustments or other changes were necessary to

switch from one fuel to another. They ran smoothly on all, in fact, idled down to 375 rpm even while running on gasoline.

This is somewhat unusual as the compression ratio of the vee-8 is only 17 to 1 and in the in-line six 17.5 to 1. Higher compression ratios have been thought necessary for operation on gasoline.

The in-line Polydiesel follows the general constructional pattern of the direct-injection engines once allowance is made for the different combustion system. It uses an in-line multi-plunger fuel injection pump and pintle nozzles. So does the vee-type engine.

Construction of the vee's is something else again. The blocks are one-piece aluminum alloy castings with cast iron liners. These are wet type, made of a special alloy. Each cylinder head covers two cylinders for a total of four per engine. Side-by-side connecting rods are used. Pistons are heat-treated aluminum alloy.

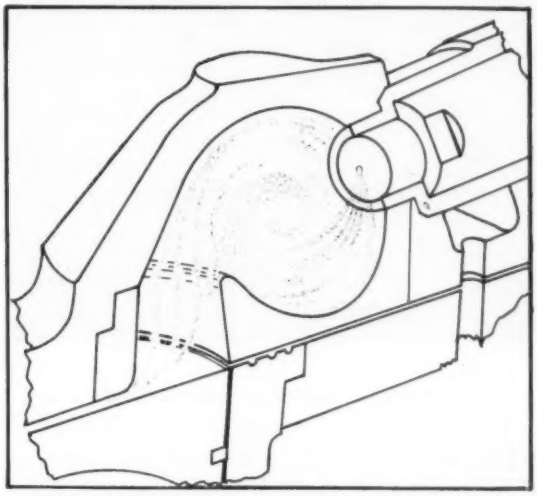
Generous use of aluminum and the paring out of all excess weight has produced an engine which at its maximum rating gives a weight of approximately 5 lb per hp. Peak horsepower at maximum fuel settings on diesel fuel is about 300 hp at 2800 rpm.

Summing up . . .

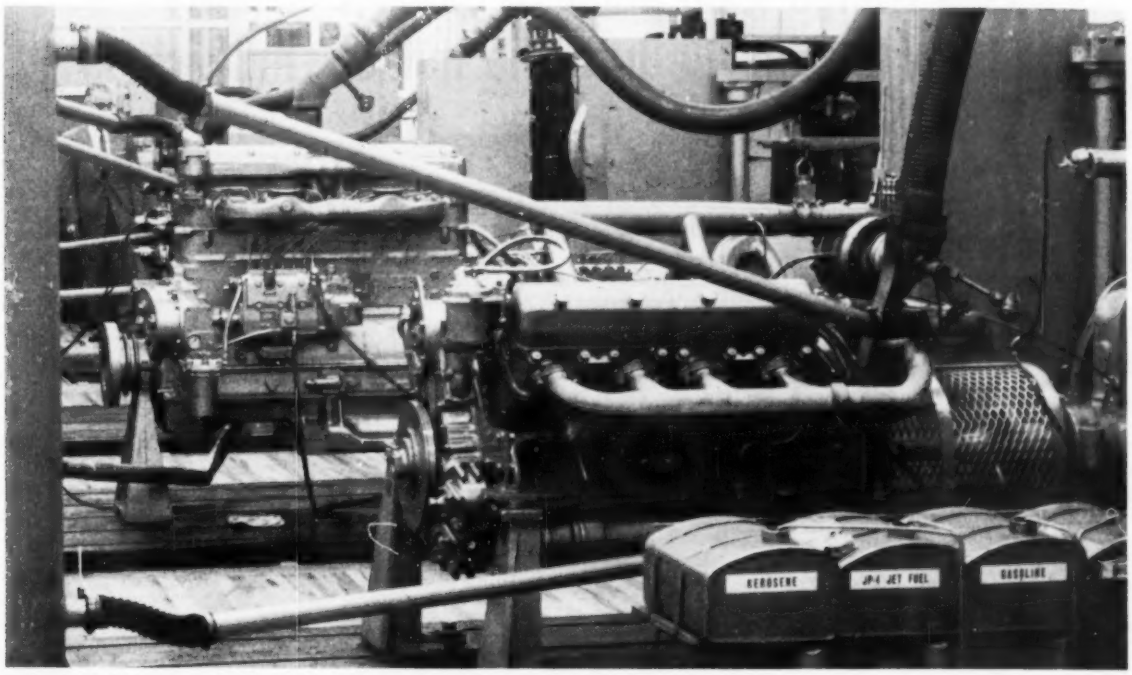
Hercules officials indicate that they are on the move and they are satisfied that they have the right line to move with. In the direct-injection series they feel they have engines of the right size, weight, horsepower and cost to fill the bill for the bulk of light vehicular applications. They are suitable for general applications.

With no gap in the horsepower range, the turbulence-chamber engines provide suitable competitive units for installation in larger vehicular applications. Unique features of these engines—multi-fuel capability, low weight per horsepower, freedom from diesel knock—apply in general application and have particular attraction for the Military.

Plus the features mentioned, the whole line is built for long, tough service. We were assured that nothing that built the diesel's reputation for ruggedness and reliability had been sacrificed to achieve a particular result. These are the engines that according to Mr. Pringle will ". . . create a whole new market for Hercules diesels."



Success of multi-fuel capability stems from turbulence chamber design.



Turbocharged, aluminum block vee-8 demonstrating its multi-fuel capability on 4 common fuels.

1. Pistons with Ni-Resist inserts in the top ring grooves... where heat, wear and acid attack is highest... are original equipment in 9 x 10½-inch Alco Products engines.

2. To reclaim worn pistons for users, Alco machines down the ring carrier then shrinks and welds on a new carrier, also equipped with Ni-Resist inserts.

Two things Alco does to put heavy-duty aluminum piston life into the million-mile class

Several years ago, ALCO Products, Inc., a leading builder of diesel locomotives and engines, adopted as standard Ni-Resist* nickel-chromium cast iron inserts for the top ring groove of oil-cooled pistons on its 9 x 10½-inch series of engines.

ALCO found that Ni-Resist inserts demonstrate outstanding resistance to high temperature, wear, and corrosive attack by combustion gases. Ni-Resist inserts also reduce "blow-by" and lower oil consumption. And because the thermal expansion characteristics of Type 1 Ni-Resist alloy closely match those of aluminum alloys used for heavy-duty pistons, ALCO found that the bond between the two was excellent.

Recently, ALCO found a way to stretch its piston life further... well into the million mile class. A procedure has been developed to machine off the old Ni-Resist insert ring carrier when it becomes too worn for further services, and replace it with a new Ni-Resist insert ring carrier (see picture above right). The new carrier, by an ALCO patented method, is shrunk-fit and welded into place. Through this procedure, engine users are getting more than two million miles of life from their pistons.

Ni-Resist castings boost life of many diesel engine parts

No other cast metals provide such a useful combination of engineering properties in many diesel engines as the Ni-Resist nickel-containing cast irons . . . in *exhaust manifolds* and *valve guides* to resist 1400°F temperatures while matching expansion properties of associated metals . . . in *cylinder linings* to resist corrosion from water and acid combustion products . . . in *pump impellers and housings* to resist erosion by high velocity cooling water . . . in many other parts.

When you buy diesel equipment with Ni-Resist parts, you can be sure of lower maintenance costs and better performance. So specify Ni-Resist nickel-chromium cast iron in the places where it can do you the most good.

*Registered trademark

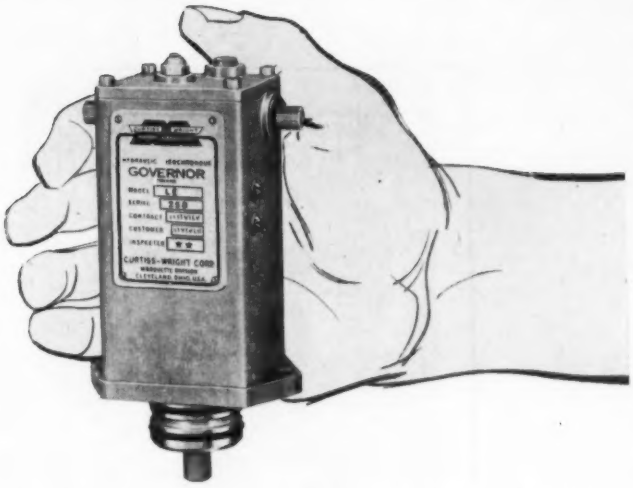
THE INTERNATIONAL NICKEL COMPANY, INC.

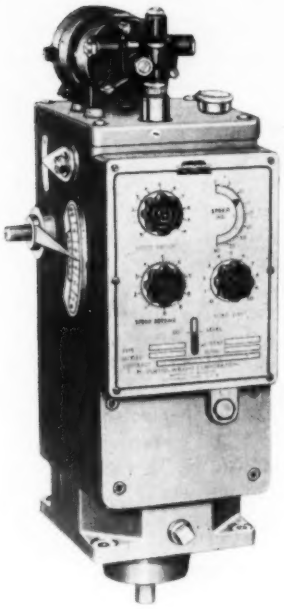
67 Wall Street INCO New York 5, N. Y.

NI-RESIST®

NICKEL MAKES ALLOYS PERFORM BETTER LONGER

High Quality Hydraulic Governing... Big Engines — Small Engines





Isochronous regulation with close control available for all engine sizes . . .

TODAY'S engine governing requirements are tougher than ever before. Modern communications setups, new weapons systems, ground support units for both military and commercial use, and even what used to be routine power installations are all demanding closer frequency control. Such terms as "isochronous regulation", "small transients" and "fast recovery time", all in line with tight military specs, are practically standard.

Where once these characteristics were expected of only large generator sets, they are now demanded—and are being met—by 1- and 2-cyl engine-generator sets. Why not? Hydraulic governors that did the job so well with large units are now available for the smallest.

Here's an example of one size range Curtiss-Wright's Marquette Division has their M-2 governors with a standard work capacity of 120 in.-lb and in special versions up to 180 in.-lb. At the other end of the range is their LE model with 8 in.-lb work capacity. Size and weight are in keeping; it fits the palm of your hand and weighs about 3½ pounds.

This small size and low weight, plus ability to operate either horizontally or vertically, extends the range of application to most small engines. The controlling factor is its 8 in.-lb work output. For extremely small engines, requiring not over 2 in.-lb output, the governor's gear pump and sump are eliminated, making it even smaller, and the governor works on 40-psi oil from the engine.

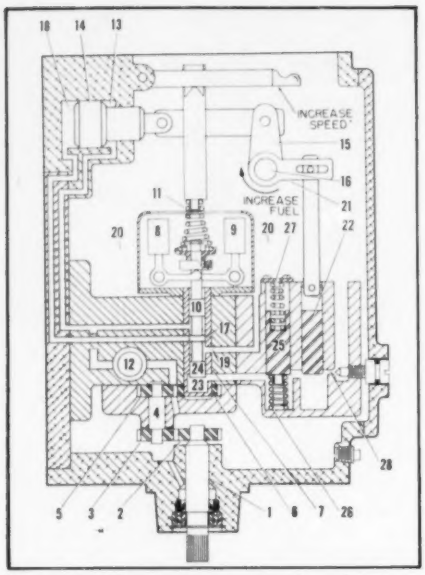
What has been sacrificed in getting governor size so small? Practically nothing, in fact, it has all the systems and features of the larger models ingeniously combined into the tiny package. Let's look at both of these governor sizes and compare them.

First, details of the M-2 . . .

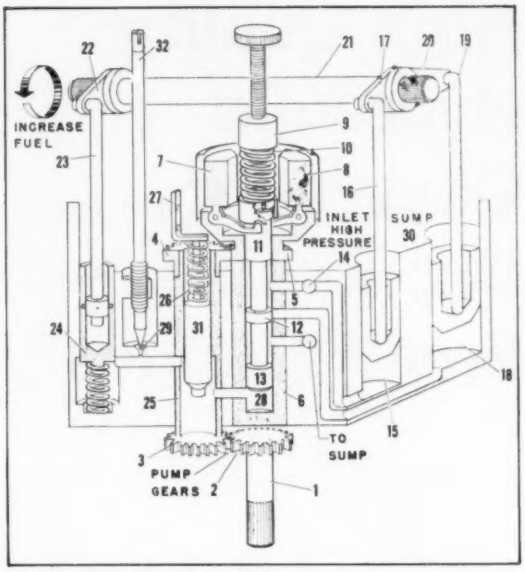
Governor parts are shown in the schematic drawing. Shaft (1) is driven by the engine and through gears (2) and (3) drives transfer shaft (4). Gears (5) and (6) form the oil pressure pump and gear (6) also drives sleeve (7) and its upper housing that supports flyweights (8) and (9). The bore of the hardened sleeve also acts as the sleeve for the non-rotating pilot valve (10). As flyweights move outward, their toes move the pilot valve against pressure of speeder spring (11). Sleeve rotation reduces friction to a minimum.

Pressurized oil enters at (12) and flows to the pilot valve above the land and to small-area side (13) of the differential servo piston (14). Pressure at (13) is continuous. The servo piston is attached to the lever arm (15) on the output terminal shaft (16). With the pilot valve centered, oil is locked in the large-area side (18), blocking servo piston movement.

If the weights move inward, lowering the pilot valve, land (17) allows pressurized oil to act on the large area (18), overpowering the constant pressure on the small area, and moving the terminal shaft toward increased fuel. If weights move outward, raising the pilot valve, oil can flow from area (18) through spill port (19) to sump (20). The constant pressure on area (13) then moves the terminal shaft toward decreased



Schematic of M-2 showing components and systems.



LE has same systems miniaturized.

fuel. The one land thus controls the differential power system.

A compensation system embodying a patented proportioner is at the right. Crank (21) on the terminal shaft moves balance piston (22). A passage from under this piston leads to chamber (23) under the pilot plunger (24) and to a space under proportioner piston (25). The piston is supported between two springs (26) and (27). The compensation system breathes to sump (20) through adjustable orifice (28).

In a typical operating sequence, assume that load is applied to the engine. Weights move inward as speed decreases and the pilot valve moves downward. The servo piston moves the terminal shaft to increase fuel. Balance piston (22) moves downward, displacing oil to the point of least resistance. This will be the proportioner piston and it will be pushed up until its top spring resists with a force equal to the downward offspeed force on the pilot valve. At this point a force balance exists in the compensation system. Further movement of the balance piston hydraulically forces the pilot valve up to the center position, stopping servo piston movement.

Terminal shaft movement stops at the new fuel setting and the pilot valve is centered. The proportioner piston is still above center. It returns to normal as oil bleeds through the orifice. During this period, a gradually diminishing force is maintained on the pilot valve to keep it centered as the engine regains speed.

Action on load removal is the opposite, with compensation action being one of suction rather than of pressure.

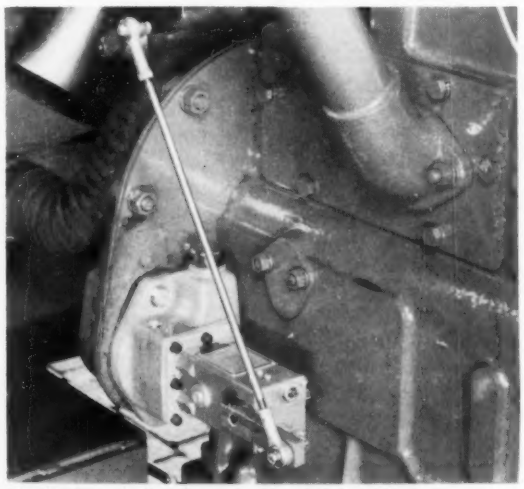
Now, a look at the LE . . .

Checking the schematic drawings of the LE governor shows some rearrangement of parts and differences in their design. Functionally, however, the two governors are much the same and most design alterations were made to cut size and weight.

Starting at the drive, the gears, transfer shaft and flyweight assembly are all there. One change is that gears (2) and (3) form the oil pump in addition to their driving function. Another difference is that the pilot valve (11) is turned and sleeve (6) is stationary. Relative motion to reduce friction is still maintained.

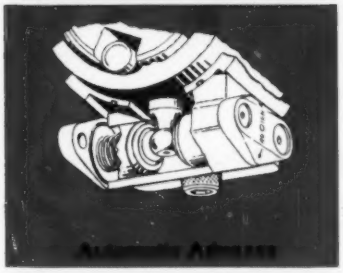
Land (12) on the pilot valve controls the differential power system as in the M-2. Pressurized oil enters at (14), filling the space above the land and putting pressure on constant pressure piston (15). The action of the differential servo piston in the M-2 is duplicated by constant pressure piston (15) and power piston (18) with their links and lever arms on the terminal shaft.

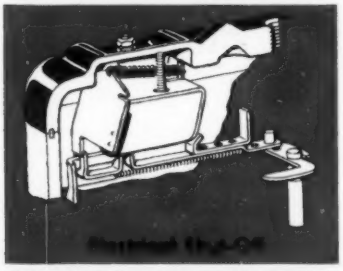
(*Continued on Page* 35)

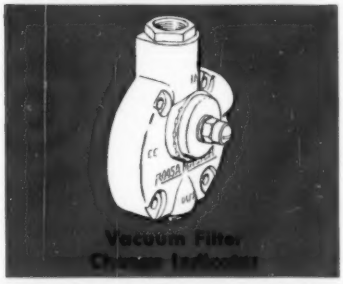


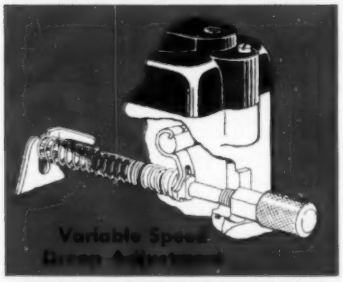
Application of LE with own pressure pump and sump.

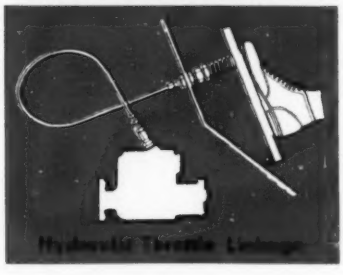
A few accessories that add versatility:

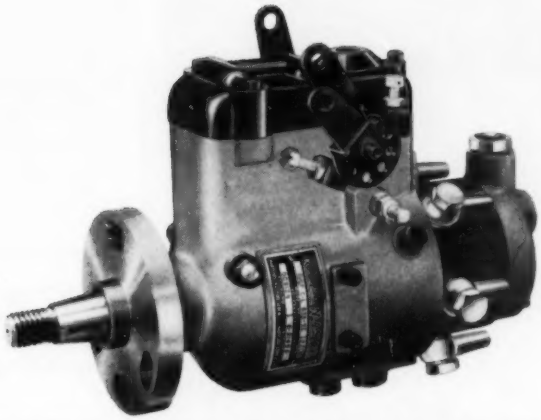












ROOSA MASTER

Most Versatile
FUEL INJECTION PUMP

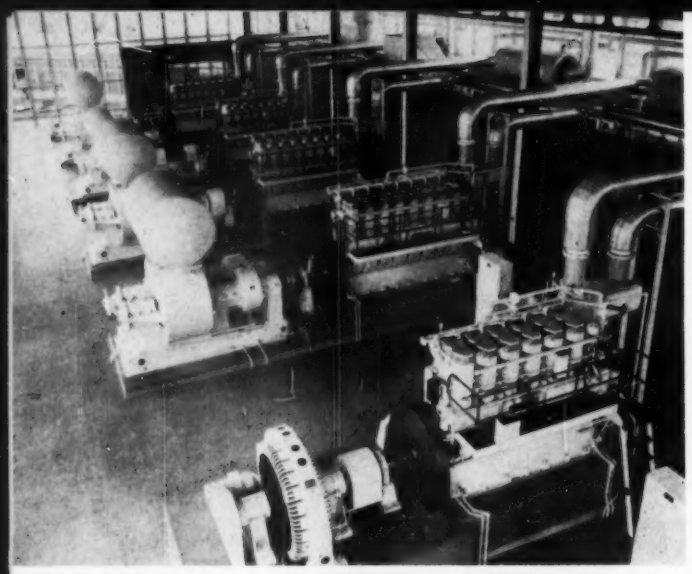
Diesel engine manufacturers, their designers and engineers are specifying ROOSA MASTER because they know that it is the most versatile. There are many reasons for selecting this pump. Here are just a few:

- **VERSATILE** because of the variety of built-in, space saving, accessories demanded by modern diesel engine design. Roosa Master can provide more compact, lower cost, complete units to meet many different applications.
- **VERSATILE** because only one size pump serves either a 2, 3, 4, 6, or 8 cylinder, 2 or 4 cycle, small or large displacement engine . . . and only Roosa Master can be mounted vertically or horizontally.
- **VERSATILE** because it is applicable to automotive, construction, farm, generator, marine and stationary equipment guaranteeing dependable, economical service. Write for further information.

HMS ROOSA MASTER makes good diesels better

Member

HARTFORD MACHINE SCREW CO., HARTFORD 2, CONN.
Division Of Standard Screw Company



Men behind the plant:
Comissioner, Arthur H. Niles (right)
Plant Superintendent, Elmer L. Pollex
Consulting Engineers, Consoer, Townsend and Associates.

Natural gas engines make possible an economic and progressive approach to vital problem of sewage disposal . . . point to a continually expanding market.

SPECIAL REPORT BY DIESEL POWER

Toledo's Modern Sewage Treatment Plant . . .

TOLEDO, Ohio's new $9,500,000 secondary sewage treatment plant represents a modern, economic approach to the problem of sewage disposal in the face of rapid population and industrial expansion. This type of plant, using natural gas engines to power an activated sludge type facility, will be found in an increasing number of progressive municipalities across the country. A look at Toledo's plant explains why this method is becoming so popular.

Bay View Park is the site of the expanded facility. Fight fans may recall the location, for it was in this park Jack Dempsey demolished Jess Willard in one of the most famous heavyweight championship fights of all time. Toledo's rapid growth since that time points up the need for adequate sewage disposal. The program which they have underway accomplishes this and more.

This new plant allows the removal of approximately 85% of the pollutional material in the collected wastes. The present flow is about 50,000,000 gallons of sewage daily. Up to 70,000,000 gallons daily can be treated completely, and flows up to twice this amount can be given primary treatment.

The multi-fuel engines that power the plant, plus some refinements in the treatment set-up, take some of the sting out of the tax bite. For example, by burning the sludge gas, the city will save about $50,000 yearly. Another saving comes in the sale of the dried sludge from the digestion tanks for use as a soil conditioner.

Power from multi-fuel . . .

Powering the secondary plant are five Enterprise engines. The 5 gas engines are model G series, 4-cycle, 12-in. bore by 15-in. stroke. Three of the engines are turbocharged. All have tri-fuel capability, operating as spark-ignition gas engines, dual-fuel or diesel engines. In this operation they run primarily as high-compression gas engines.

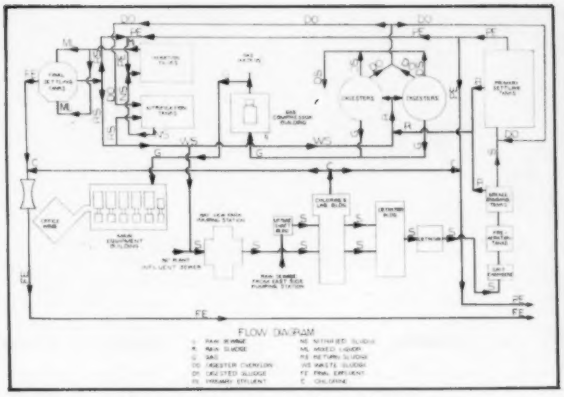
Sludge gas, a byproduct of the sludge digestion process, is the principal fuel used. For dead plant starting. and during periods when volume of sludge gas is limited, natural gas is used. Natural gas is also used to insure a constant Btu value of the gas going to the engines. An automatic calorimeter monitors the Btu content and blends the gases as required. Sludge gas is stored at 40 psi and natural gas in the supply main is at 20 psi. Instrumentation and regulators in the calorimeter appropriately reduce these pressures, blend as necessary and provide a fuel supply to the engines at the proper pressure and a constant Btu value.

The engines . . .

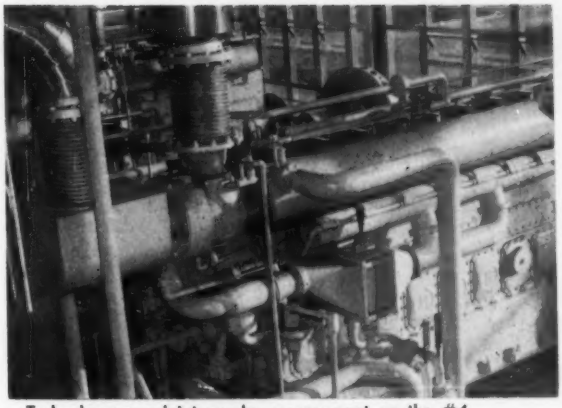
Engine number one, a model TDGSG-8, is a naturally-aspirated, 8-cyl, 425-hp at 327 rpm. It drives a blower which produces 4-psi air at the rate of 20,000 cfm. We'll be mentioning the 4-lb air system a little later. It plays an important part in a refinement of the aeration system that leads to a reduction in the horsepower requirement for air.

Number 2 is a TDGS-6, naturally-aspirated, 6-cyl engine turning out 438 hp at 400 rpm. It drives a smaller blower rated 10,000 cfm at 8 psi. Engines 3 and 4 are TDSG-38's. Both are turbocharged 8-cyl engines, each putting out 850 hp at 327 rpm. Both 3 and 4 drive blowers rated 20,000 cfm at 8 psi.

Engine 5, a turbocharged TDGSG-36, 6-cyl, 506 hp at 400 rpm, drives an 80%-power factor, 3-phase, 60-cycle, 480-volt generator rated 350 kw at 400 rpm. With this 5th engine in operation the plant is just about independent of outside power sources. In addition to normal electrical service, power is also available for a high-horsepower motor driving a blower rated 10,000 cfm at 8 psi. This is used as a standby to provide air for aeration should one of the engine-driven blowers be shut-down.



Flow diagram shows sludge gas route from digesters through compressor to gas holder, thence to engines.



Turbocharger and intercooler arrangement on the #4 engine is typical of the turbocharged engines.

There are a number of high-points in the operation of the Toledo plant which prove up the foresight of its designers and the efficiency of this type of sewage disposal system.

Air system . . .

A filter room provides clean air for both the aeration blowers and the engines. A screen eliminates leaves, bugs, etc. Primary filtration takes places in a fiberglass-type unit. This is American Air Filter's Roll-O-Matic in which a roll of the filtering media is used. The fiberglass passes through a frame to a take-up roll. As dirt builds up and restriction tends to increase, a new portion of the roll is exposed. Thus, by timing movement to the rate of dirt buildup, both filtering efficiency and flow restriction are held constant.

Secondary filtration takes place in electrostatic precipitators. Even the finest dust particles are attracted to the unit's plates. Air supplied to engines and blowers is really clean, contributing to the life of both.

Engine air is then carried by a 20-in. main to an air header on the balcony. The two naturally-aspirated engines receive their air supply directly from the header. Air supply for the turbocharged engines, however, passes through a pre-cooler. This is an in-line American Air Filter evaporative-type unit, unique in design and effective in function. It can be seen in the illustration. Air enters an enlarged section of the header and passes through three tiered fiberglass panels which are continually wetted by a water spray. This pre-cooler reduces temperature of the air before it enters the turbochargers.

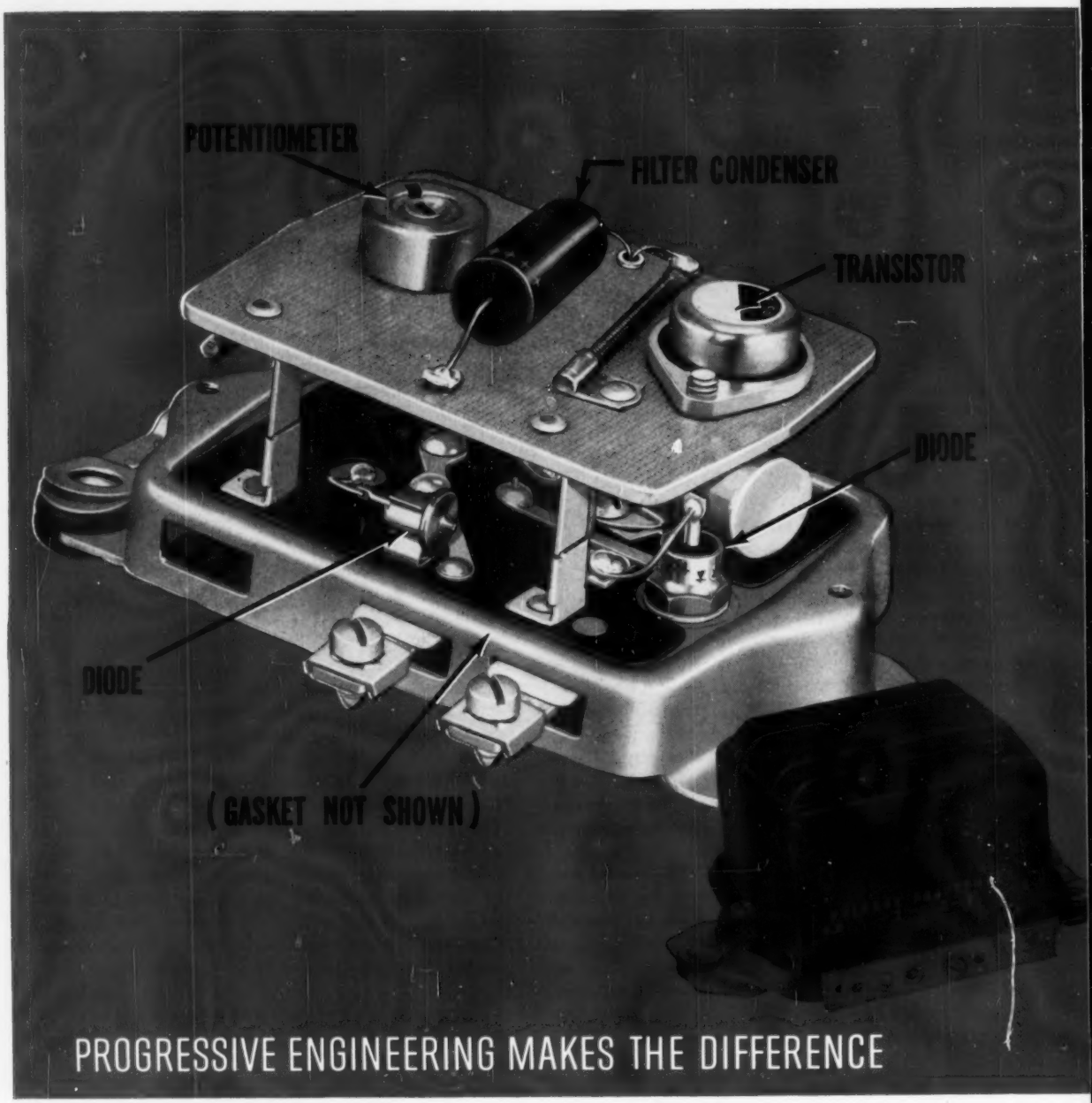
After the turbochargers, the air is again cooled by intercoolers, as shown. Intercooler water is cooled in an independent system. Heat picked up from the air is removed in coils in the aeration tank influent channel. With the combination of pre-cooling and intercooling, the turbocharged engines get cool dense air. This permits maximum output without detonation at all ambient temperatures.

Engines can be run independently of the filter room by cutting in a standby oil bath air filter. Butterfly valves are provided to shut off the main from the filter room and open the duct to the filter mounted on the header. Air is then drawn from inside the building.

Air goes down and around and it comes out here . . .

We've covered intake air. Now, let's see what hap-

Intake and exhaust air equipment on plant balcony. From left, auxiliary air filter, precooler and waste heat boilers.



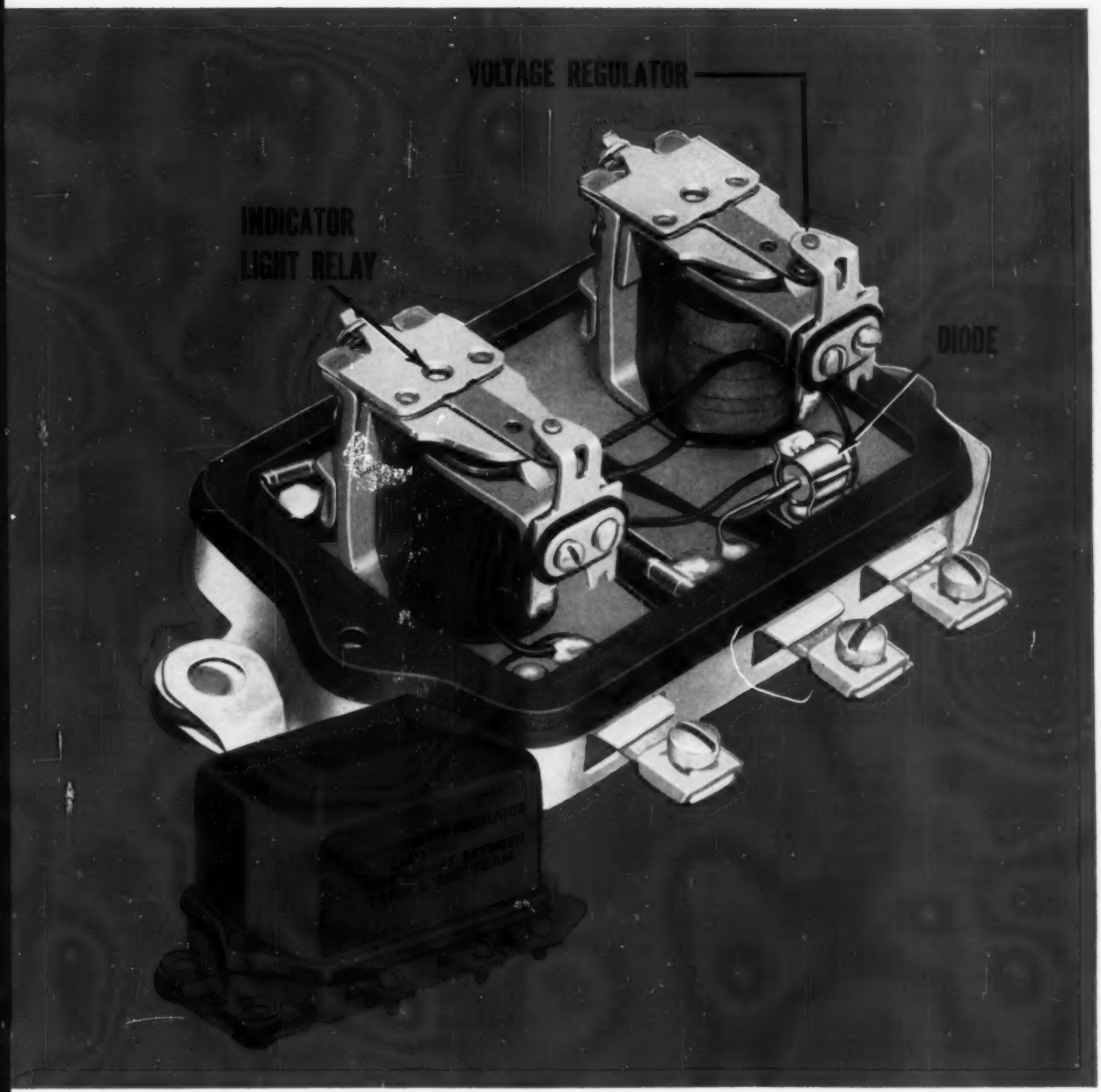
ONLY DELCO-REMY OFFERS FULL-TRANSISTOR

Designed for use with DELCO-REMY'S new self-rectifying a.c. generators

Now you can choose between *two* modern new Delco-Remy regulators—the most accurate available today. One is a full-transistor model, the other transistorized.

The FULL-TRANSISTOR REGULATOR has no moving parts and offers the ultimate in accurate electrical performance, durability and reliability. It is composed entirely of transistors, diodes, condensers and resistors, permitting higher field current for better generator performance. Constant voltage control is unaffected by temperature changes, vibration, or mounting position. A simplified external adjusting feature permits easy voltage setting for varying operating conditions. And this full-transistor regulator requires no periodic servicing.

The TRANSISTORIZED REGULATOR contains a single transistor and diode working in conjunction with a vibrating-type voltage sensing unit. The transistorized circuit



AND TRANSISTORIZED VOLTAGE REGULATORS

permits high field current for improved generator performance with low non-inductive current through the contacts for greatly extended contact life. Models are available for circuits containing either ammeters or indicator lights. All units are temperature compensated to better match battery voltage requirements.

Both the full-transistor and the transistorized models have the same mounting dimensions as standard regulators.

Whichever model you choose for your new vehicles or for replacement on present ones, you can be sure of reduced servicing and extended battery life. Available from your car or truck dealer or through the United Motors System.

FROM THE HIGHWAY TO THE STARS

Delco-Remy

ELECTRICAL SYSTEMS

GM GENERAL MOTORS

DELCO-REMY • DIVISION OF GENERAL MOTORS • ANDERSON, INDIANA

pens to the exhaust gases which come out of the other end of the engine. The exhaust stack from each engine passes through a waste heat boiler. Circulating jacket water, leaving the engine at approximately 165° F, is heated by these exhaust heat exchangers to about 180° F.

This heated water is then used for both building heating and sludge heating. It then begins its circulation through the system again at approximately 140° F. In the summer, if it has not cooled to the desired 140° it is run through a cooling coil in the aeration tank influent channel.

At times when heat from this system is inadequate for all plant heating and processing requirements, a pair of oil or gas-fired standby boilers is used. Their output can be connected to the lines serving the plant by suitable valving.

Kraus Interchange and Distributed Air System . . .

Two modifications of the conventional activated sludge system have been incorporated into the Toledo works. Both of these were developed by Mr. L. S. Kraus, Chemist of the Greater Peoria Sanitary District. They have contributed much to the operation and economy of this type of plant.

The first is known as the Kraus Interchange Process and involves operating part of the aeration tank facilities as nitrification tanks, permitting the diversion of digestor liquor to the nitrification tanks, plus facilities for adding nitrification tank contents to the aeration tank influent. The use of this process means that all flows, at least up to the design average of 70 mgd will pass through the secondary treatment unit.

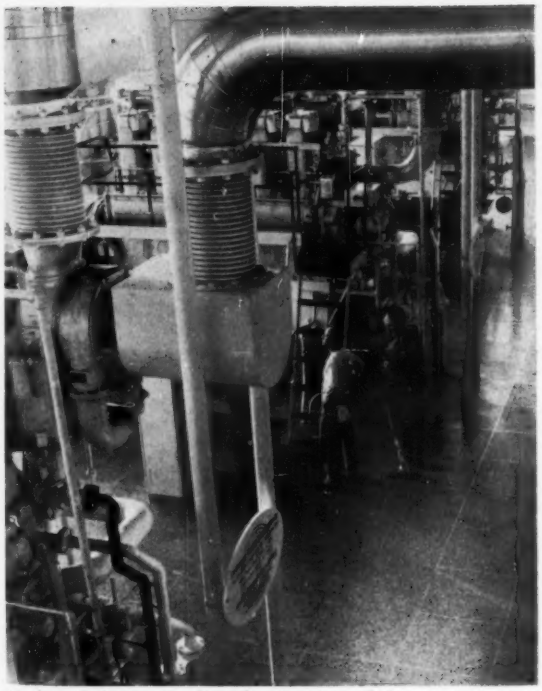
The second of Mr. Kraus' innovations is a variation in the method of introducing air to the aeration tanks. This new method uses the same volume of air per million gallons of sewage treated. A real economic advantage is realized in that half of the air is introduced at half the pressure of the conventional system, that is 4 psi instead of 8 psi. The saving in power required to provide air is considerable. Additionally, increases in oxygen utilization are obtained. This means shorter detention periods in the aeration tanks.

Summing Up . . .

Toledo's new secondary treatment facilities have been carefully engineered for the utmost in economy and the maximum ability to do the job. Additionally, the plant is a good neighbor in that it is inoffensive to residents nearby. It is even more importantly a source of civic pride, for in the face of a continually expanding population, it is aiding greatly in preventing pollution of the Maumee River and the nearby Bay area. This means more useable recreation area for Toledo's citizens.

The economic factors make it outstanding in that every means of reducing operating costs has been utilized. This makes it easier on John Q. Public when it comes to taxes. By-product gas is burned. Sludges are sold for soil conditioning. The plant is virtually independent of outside power sources. Waste heat provides heating for the plant as well as for processing.

Plus this a good air filtration system protects the engines and blowers to give lower wear, less downtime and longer life. And the whole system for this vital municipal function is made possible by hard-working, smooth-running engines. It's a good pattern for others to follow.



Modern design means clean, functional installation in easy-to-clean, well lit building.

Principal Equipment

Engines—Enterprise
- Spark Ignition System—American Bosch
- Fuel Injection—Bendix Scintilla
- Governors—Woodward
- Silencers, Waste Heat Boilers—Maxim
- Turbochargers—Elliott
- Pre-cooler—American Air Filter
- Intercoolers—Young
- Filter, silencer (auxiliary)—Air Maze
- Filter, air—Roll-O-Matic (Filter room)
- Filter, air precipitation—Electro-Matic (Filter room)
- Filter, lube oil—Briggs, Air Maze
- Filter, fuel—Winslow
- Pyrometers—Alnor

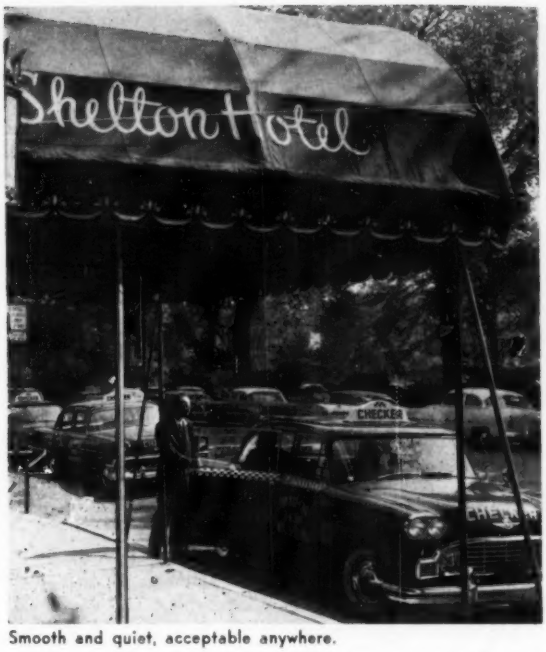
Generator—General Electric
- Motor, blower, standby—Electric Machinery

Blowers—Roots-Connersville
- Silencers—Burgess Manning

Now — GM's Taxicab...

BY BRIAN P. EMERSON

In service for just a few days, GM is trying out their 3-cyl, Series 53 in a Checker chassis. Here is the first report on this installation.



Smooth and quiet, acceptable anywhere.

A new Checker Cab stood parked at Detroit's Metropolitan airport. It had nothing to distinguish it from other cabs except perhaps its newness. But lift the hood and it was a different story—a diesel story.

GM's Detroit Diesel Engine Division has recognized the need for diesel economy and long life in the lighter commercial vehicles, in fact, produced their Series 53 with such applications in mind. Taxicab powering was included in their thinking. They're serious about entering this field.

The first step was to install the 3-cyl, Series 53 engine in a Checker chassis. After "Engineering" had a go at the job and the installation completed, the cab was given an extensive proving-ground workout. Final proving must come, however, in actual cab operation.

This cab had been in service for just two days but had already racked up 750 revenue miles. It is the first diesel in the 8-cab fleet of Mr. Ray Eggen. He is a 30-yr veteran of fleet operation and like others is looking for a way to hold the cost line. Hence the move to diesel power.

Incidently, if you're wondering about the "Checker" setup it works like this. Detroit's Checker organization is actually an association of individual fleet operators, all carrying the name and painting their cabs the same way. The Association assists in general management, handles dispatching and provides maintenance facilities. In short, through cooperative effort all the duplication of individual functions and facilities is avoided.

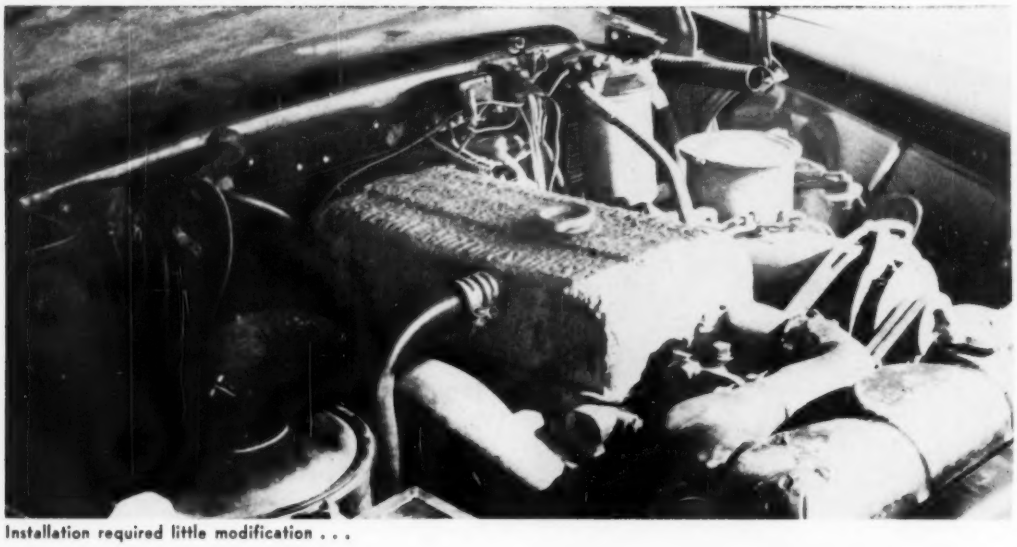
Driver reaction . . .

A couple of day's operation is not much on which to base an operational story. We did talk to the driver, Mr. E. Fite, to get his impressions. Mr. Fite is himself a veteran in the cab business and at one time owned his own fleet. Finding out that he had this background, we asked his views on diesels in this service and what factors he considered most important.

Driver Fite wants economy . . .

Need for economy was foremost in his mind. He was well aware of the cost squeeze on operators and even the short operating period was sufficient to convince him of substantial improvement in fuel mileage.

Reliability is important. Drivers want to work the full shift, not sweat out non-revenue periods taking the cab to the garage or waiting for a repair truck. Some drivers lease cabs on a daily basis and a breakdown can make it a losing proposition. They don't want to — and won't



Installation required little modification . . .

— take an ailing cab out of service unless it absolutely quits. He's sold on diesel on the basis of its reputation for ruggedness, reliability. Time will confirm this.

About the cab itself? He liked it. It has all the power necessary for acceleration and staying with any traffic. Did the added weight (registered weight is 4040 lb) change the handling? No, there was no noticeable difference from standard Checker cabs. This was confirmed by his answer to the next question.

Did he think drivers would have to go through a transition period to handle the car properly? No, there was no problem. He felt that any driver could take over and be at home in a few minutes. The standard shift transmission with automatic overdrive was familiar.

Any complaints, on noise, for example? Only a few, perhaps two out of ten customers, noticed any difference or at least commented. When told it was a diesel, they were interested, even enthusiastic.

Driving the cab . . .

Prior to going into actual service, opportunity was afforded to drive the cab. The switch turns on electrical power and another eighth turn engages the starter. Just like an ignition switch. A pull-knob provides manual shutdown.

Idle is at 500 rpm and is quite smooth. Noise level is somewhat higher than for a gasoline engine but not objectionable. In traffic and at normal cruising speeds, other road and wind noises take over. You hear the "marbles", characteristic of the combustion in this 2-cycle engine, but it sounds a lot like the preignition — and no louder — that you often hear in gasoline-powered cabs during acceleration.

There's plenty of torque. Response is good even at the low end of each gear range. Deliberately lugged down, it responded to the accelerator pedal and accelerated with a minimum of fuss.

Shift is a 3-speed forward, one reverse, with an automatic overdrive. Engine and overdrive were connected to the regular cab transmission without modification. The overdrive is set to cut in and out at about 22 mph. This cuts engine rpm, lowers the noise level above the 22-mph mark and improves fuel mileage. It also indicated that plenty of torque is available.

The driver confirmed our earlier findings on handling. Steering is normal, there's plenty of pep for any mature driver and shifting is smooth and easy. The engine's 97 hp at 2800 rpm and the diesel's high torque characteristics give operational flexibility closely approximating that of gasoline-powered jobs.

Later, riding as a passenger, we found little to distinguish this cab from any other Checker. Noise level was perhaps a little higher than in a new gasoline-powered cab but certainly no worse than in some that have been on the road a while. In traffic, there was no feeling that concessions were being made; the driver cut in and out of holes in conventional fashion.

The engine went into the cab with little modification. Heavy-duty springs, regularly offered by the Checker Cab Manufacturing Company, were adequate to handle engine weight. No changes in the frame or other structural components were necessary. Engine length was okay and while the width is somewhat more than for in-line gasoline engines, it is less than most vee-8 installations with much better accessibility to both sides of the engine.

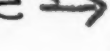
What's ahead?

Diesel Power has been actively promoting this taxicab market and application of diesels in light trucks for some time. It is good to see some results and to feel that we had some hand in them. We were invited to see this vehicle, went, and were very pleased with what we saw.

What's next? Detroit Diesel, according to Mr. Robert E. Hunter, general sales manager, is very much interested in both the taxi and light-truck dieselizing program. This cab represents a step toward the cab field — light-truck repowering is moving along.

This first step is one of evaluation. They want to take the guesswork out of ownership and operational costs. Engineering bugs are pretty well worked out. Then will come the matters of pricing and availability.

One word to Detroit Diesel — don't take too long; this field is moving fast.

If it rolls on an axle or turns in a bearing or rides on a shaft if it slides in a groove  or moves on a pivot if it bores or cuts or transmits pressure one of Sinclair's 500 specialized lubricants is designed to make it work better. For answers to your lubrication problems, write today to

SINCLAIR REFINING COMPANY

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600 Fifth Ave, N.Y. 20 N.Y.

Sinclair

Why this cooler "weeps" to save you grief

PARACOIL

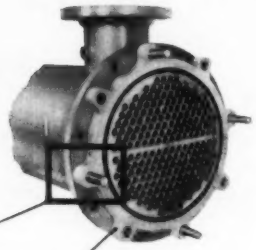
EXCHANGER TYPE PC

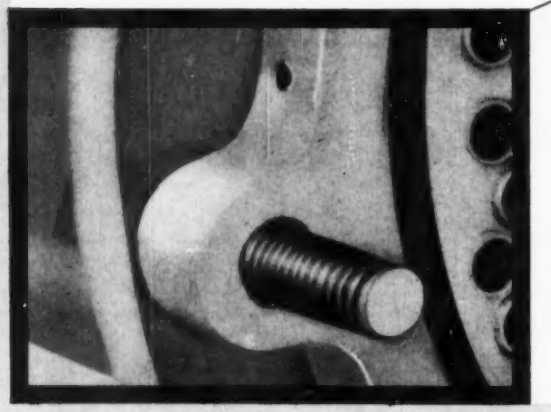
FOR ☐ COOLING ☐ HEATING

☐ OIL ☐ WATER ☐ AIR ☐ GAS

"Weeping" through the weep holes in the unique retainer ring of this PARACOIL PC Exchanger immediately indicates that the floating tube sheet packing needs attention: tightening, adjustment or replacement. It serves as a timely warning to prevent more serious troubles that often develop in conventional packing glands.

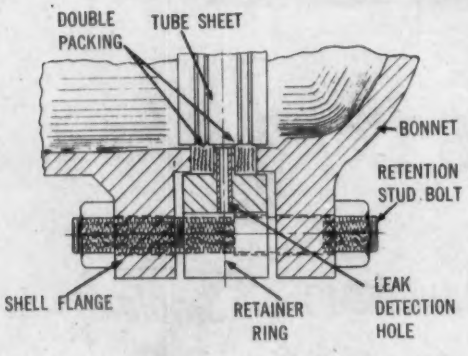
But most important, **absence** of weeping indicates that the packing is holding—hence no dismantling of the exchanger to inspect the packing is necessary.





The PC retainer ring is an exclusive design feature of this exchanger that greatly speeds and simplifies inspection and servicing. It holds the tube sheet packing firmly in place while the end chamber is removed, without clamps or auxiliary devices. (Retention studs bolt to the shell flange and screw into the retainer ring lugs.) **Simply by backing off on one set of nuts and removing the end chamber,** the floating tube sheet is fully exposed for inspection and shell side pressure testing of packing and tube ends. Piping connections remain undisturbed.

SAVES HOURS OF MAINTENANCE TIME AT EVERY INSPECTION



HOW IT WORKS

Detail of Floating Tube Sheet End

Section at packing retainer ring weep-hole. Mixing of shell and tube side fluids through the packing is impossible with these PARACOIL design features. Seepage from either side drips out the copper-lined weep holes placed at each 90° point in the ring. The nuts on either side may be taken up to tighten packing without shutdown or interruption of operation.

PARACOIL Type PC Exchanger

For details, write for Bulletin 140-A

DAVIS ENGINEERING

(A Division of American Metal Products Company)

520 Main Avenue, Wallington, N. J.

AN **amp** SUBSIDIARY

High Quality Hydraulic Governing . . .
(Continued from Page 24)

On load application, the pilot valve moves downward to allow oil to flow into (18). Area of the power piston is greater than that of the constant pressure piston. Plus this, lever (20) is longer than lever (17). Thus, the power piston can overpower the constant pressure piston and increase fuel.

When load is dropped, flyweights (7) and (8) move out and lift the pilot valve. Oil can now flow from the power piston to the sump and the constant pressure piston moves the terminal shaft to decrease fuel.

A compensation system and the proportioner feature is also provided. When the terminal shaft moves to increase fuel, crank (22) operates the balance piston (24). Action is then exactly the same as in the M-2. To save space, transfer shaft (25) was made hollow to accommodate the proportioner piston.

Push-pull spring (26) held by bracket (27) takes the place of the two springs in the larger governor. It goes into compression when fuel is increased and into tension on a fuel decrease. System pressure is corrected by bleed through the adjustable orifice (29).

It can now be seen the LE has all the features of the larger M-2.

More LE features . . .

The LE is really small. Overall length of the standard version including the speed setting screw is about eight inches. The governor portion is roughly 2-in. square and 4½-in. long, excluding the speed adjustment screw. The oil pump, sump and filler cap runs another 2¼-in. and is somewhat larger in width and height. Actually, there's little other than a boss and the filler cap that extends beyond the mounting flanges.

Three interchangable mountings include a magneto flange, Army-Navy flange and one to permit interchangability with the Curtiss-Wright Massey Type E governor and some other commercial types.

Want it smaller? If you can get away with a 2-ft. lb output, the pump and sump can be eliminated and 40-psi oil from the engine system used. This gives you a package 2-in. square and 4-in. long.

This governor, like the M-2, is capable of isochronous operation. Constant speed settings range from 1800 to 3600 rpm. Speed droop, externally adjustable, can be applied. This adds roughly an inch to the unit's length. Synchronizing motors can also be applied when specified.

For variable speed applications there is a 4 to 1 speed range. The aluminum case helps cut weight and because of rapid heat dissipation, holds governor temperatures down.

In conclusion . . .

People used to think that a diesel had to be as big as a house. The same with hydraulic governors. Both ideas have been proven wrong. For today's more sophisticated power requirements, diesels of just about any size and weight are available. And for their control, so are hydraulic governors. You can get high-quality governing from big, high-output units down to a little one you can hold in the palm of your hand.

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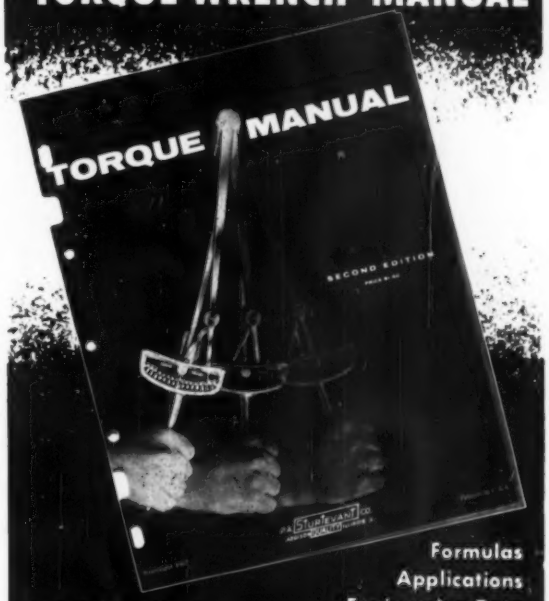
"TORQUE WRENCH" MANUAL



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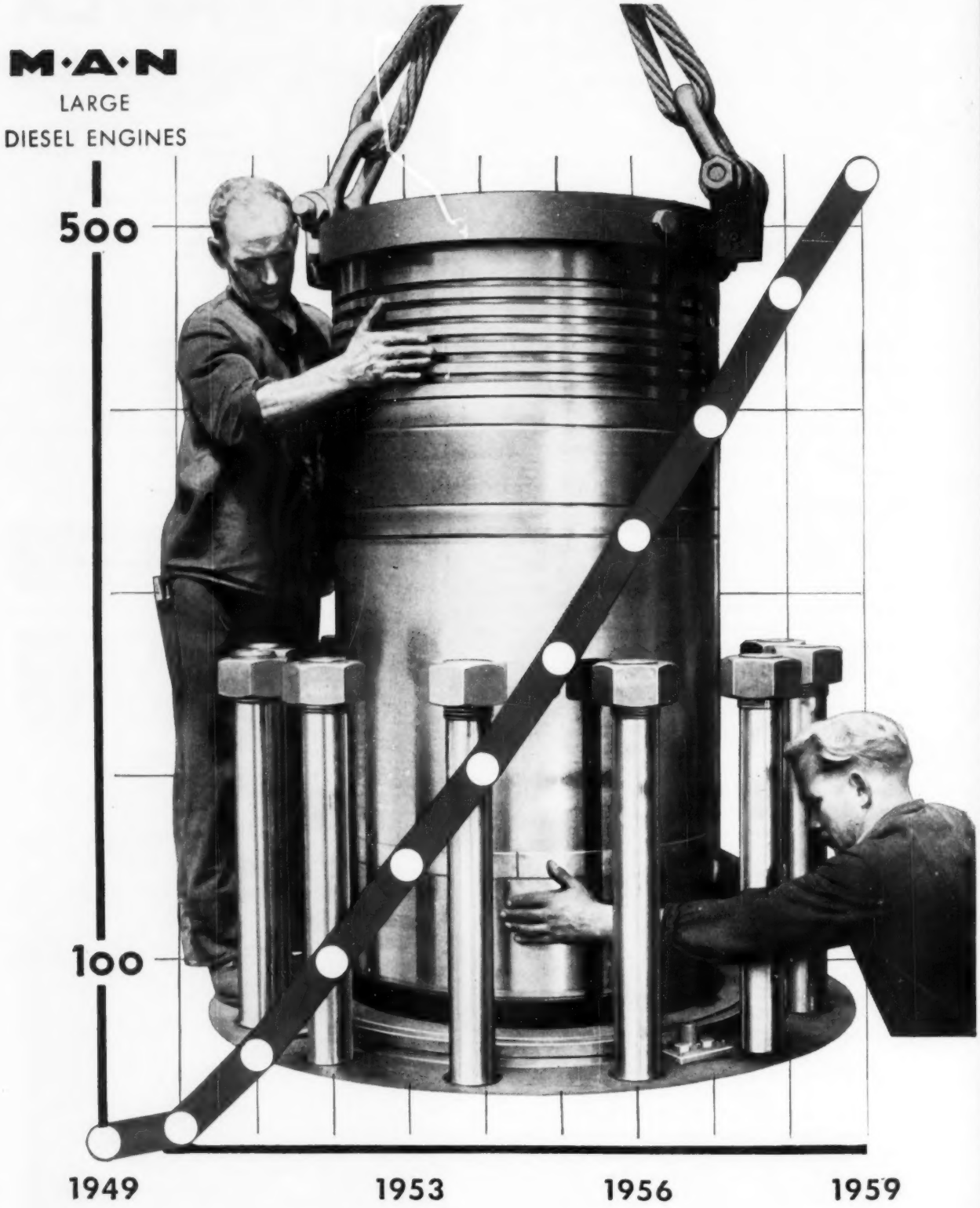

M·A·N
LARGE
DIESEL ENGINES
500
100
1949
1953
1956
1959

M·A·N

From the end of 1949 to the middle of 1959 five hundred high powered Diesel engines were built in the Augsburg works of M. A. N. Most of them, running for many weeks at a time, ceaselessly night and day, drive ships upon the oceans of the world. Augsburg diesel engines, through their renowned reliability and first-class construction, enjoy an enviable reputation among all seafaring nations. Yet, development does not rest. Today, M. A. N. build engines with 2 000 HP/cylinder output developing 20 000 HP and more. We owe the extraordinary production of 500 high powered Diesel engines in less than 10 years to the industry and skill of our craftsmen and to the confidence placed in our products by our numerous customers throughout the world.

The medal shown above was presented to all workmen and staff of M. A. N. Augsburg works to commemorate completion of the 500th high powered Diesel engine

MASCHINENFABRIK AUGSBURG-NÜRNBERG AG · WERK AUGSBURG

Top to bottom—
Board of Directors meet . . .
President Sirotek, Vice President Gerhardt and Canadian Board Member Stairs.

Manufacturing members—Secretary Franklin of Diesel Controls Corp.; F. DeLuca of American Bosch and J. Britton of Hartford Machine Screw.

Listening to Treasurer D'Aversa's report are S. Stevens and B. Ingram.

Top right, President Sirotek starts panel of manufacturer members who discussed standards.

. . . Reporting the ADS Convention

PHOTOGRAPHS AND STORY BY BRIAN P. EMERSON

a study of how such associations benefit the industry — members — and the user.

Past-President H. Wittersheim receives symbolic gavel from M. L. Ottenad.

WHAT goes on at trade association meetings? Next time your wife makes it plain that she thinks you're off to a "Marching and Chowder Society" sort of thing, show her this article. Actually, today's association meetings have real depth and purpose. Successful associations arise from a definite need and to fill it they must develop objectives and initiate action.

Let's be specific and talk about last month's Association of Diesel Specialists Conference and Exhibit held in Chicago. We propose to show that this ADS meeting benefits its industry, individual members and perhaps most important — the engine user.

This Association's activities can be broken down into four major functions:

1. Operation including programming
2. Determination of objectives and policy
3. Initiation of projects
4. Providing a forum for interchange of ideas

Hats off to the Officers, Board of Directors and members of the various committees. These men, elected by due democratic process, guide the Association, determine its objectives and policies, work long and hard.

By-Laws spell out a major objective as ". . . improvement of the diesel industry and protection of its customers." These businessmen feel strongly that if you take care of the customer's interests, all other phases of business — such as making money — fall in place. The four listed functions are all aimed at ultimately increasing customer satisfaction. Let's see how.

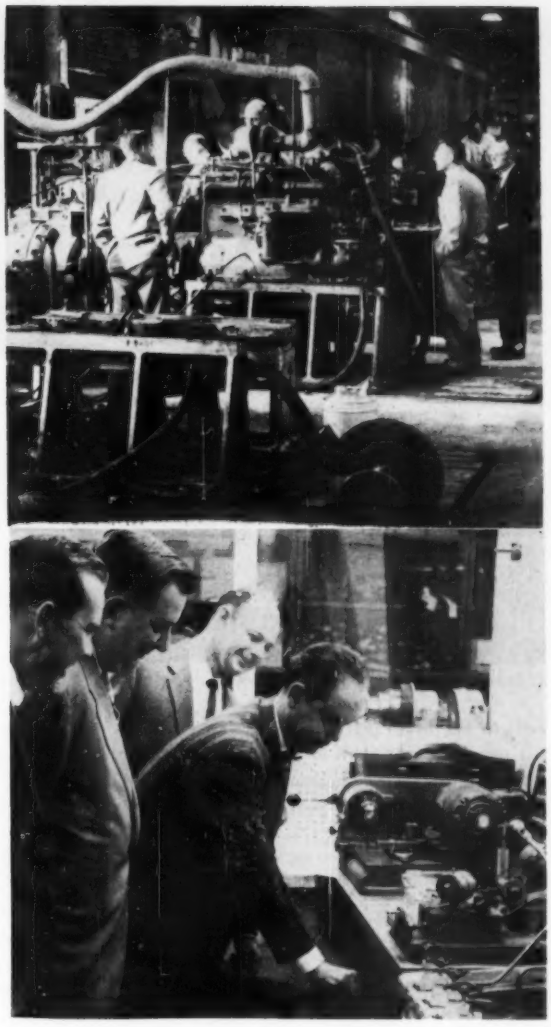
Operation including programming . . .

Just running an association is work. Ask Secretary, Stan Franklin of Diesel Controls Corp., or Treasurer Jim D'Aversa of A & D Diesel, or any other officers and board members. They know.

Programming is one phase of this activity. It takes two forms — technical and management presentations. At this meeting, technical application of diesels to mechanical refrigeration cars, fuel injection equipment as applied to the Mack engine, and methods of chemical cleaning were discussed.

On the management side, these business men heard a down-to-earth talk on Federal Excise Taxes, where and

Major addresses at the convention were made by Mr. Bruno Loeffler of Mack Co. who discussed Mack's injection equipment and bottom, Mr. Harold Halfpenny, association's attorney who advised on Excise Tax problems.



Members visited Allis-Chalmers, here watch engine testing. At right, another visit to IAE's expanded injection shop.

how they apply to their businesses. Other talks have included such important subjects as product liability and insurance, methods of inventory control.

Inspection trips are another part of programming. This meeting provided inspection of the excellent and newly-expanded shop of Illinois Auto Electric and a full morning at the engine and fuel injection equipment building facilities plus the new Research Laboratory of Allis-Chalmers, Harvey, Ill. Objective: see how others do it, talk to key people and come away with ideas.

Objectives and Policy . . .

Broad objectives are spelled out in By-Laws but their implementation and interpretation keep the governing body up well into the night.

The sheer fact of organization gives strength and a louder voice to this segment of the diesel industry. Effects are being felt both externally and internally. To engine builders, users and others, the ADS is growing in prestige and there is greater appreciation of its objectives. Within the organization there is concentrated activity to raise the general level of know-how, standardize procedures, promote highest of business ethics.

Initiation of projects . . .

Association activities don't stop between meetings. Worthwhile projects are undertaken and results fed out to the membership throughout the year.

Establishment of standards is a continuing ADS project — business standards, job standards and also test standards. Regarding the latter, the ADS has received a notable mark of recognition, particularly in view of its fairly short history. It has been invited by the SAE Fuel Injection Equipment Sub-Committee to assist in setting test standards. In fact, the SAE Committee met at the same hotel on the first day of the ADS meeting to facilitate active participation. Real progress was reported in several areas of testing.

Added to this is an ADS project to provide test pumps and accessories so that members can check their calibrating stands. Again, greater standardization.

Service information is being compiled by another committee. Every phase is being investigated and as data becomes available is being shot out to the members. This program is really beginning to roll. The idea? Improve job quality and uniformity.

To carry this last idea a step further a new committee was formed. Their task is to develop a uniform set of job standards. One customer may just want to get his pump working again at minimum cost; another expects a full "like-new" rebuild. There's a lot of difference. With established job categories, all ADS shops will approach the same class of job in the same way. The shop knows what to do and the customer knows what he has a right to expect for his money.

. . . checking for flywheel runout at Allis-Chalmers

In this and picture at bottom of the page, manufacturers and their representatives get together for informal talks at exhibits.

Forum for interchange of ideas . . .

Committee action is continually feeding ideas to the membership. These ideas add to the general pool of know-how and enable members to do a better job for the customer.

Meetings are an extension of this on a more personal basis. The technical program is tailored to interests and it is possible to get experts to address them. For small shops in which owners are primarily technical men and secondarily business men, the management part of the program can be a real service.

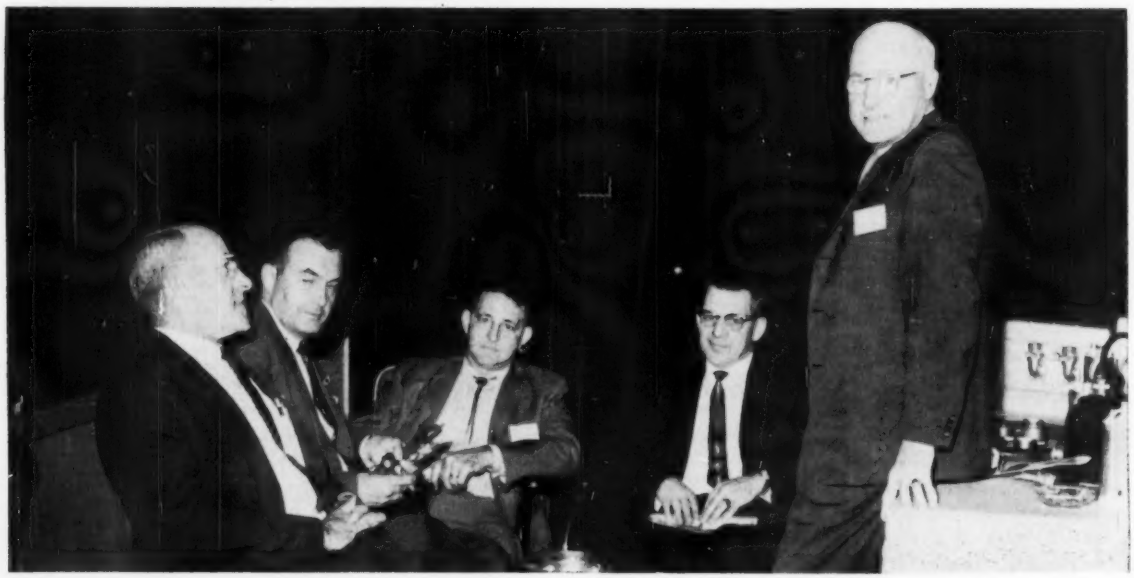
No association can live without the support and cooperation of its industry's manufacturers. This is true of the ADS. These meetings provide a time and place for contact of manufacturers with their distributors at their exhibits, in private rooms or in general sessions. Both business and technical problems can be ironed out.

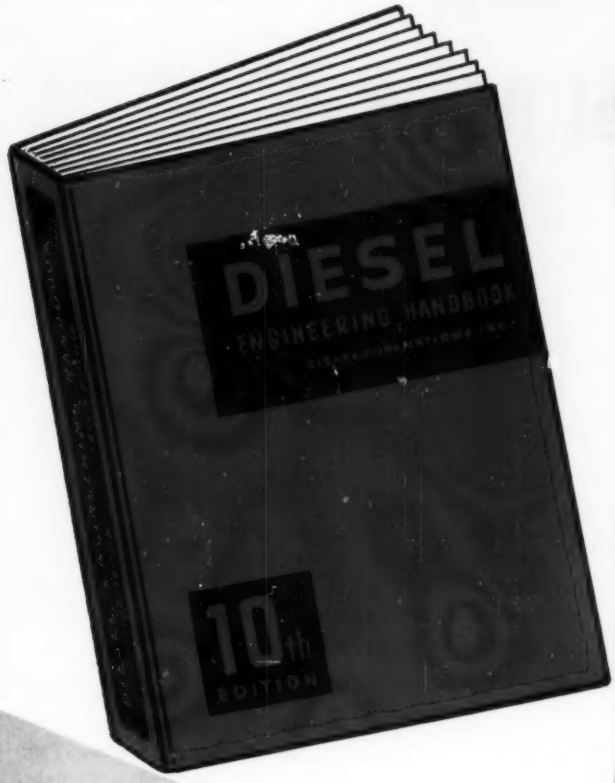
Finally, "talking shop" is a common addiction of these specialists. When you expand the area of contact to national and international proportions, throw in some of the social amenities to stimulate the flow of talk, you can't help but come away with new ideas.

To wind up . . .

Obviously, these business men feel that their trade association and its meetings — despite all the work, time and money involved — is worth while and pays off. The ADS since its incorporation on March 13, 1957 has mushroomed to 87 Service Member firms, 11 Manufacturing Member firms, and 14 in Associate categories. A total of 88 companies were represented. Why? Participation in such an active association brings real benefits to the individual, the industry and to the customer.

. . . both technical and business problems are discussed.





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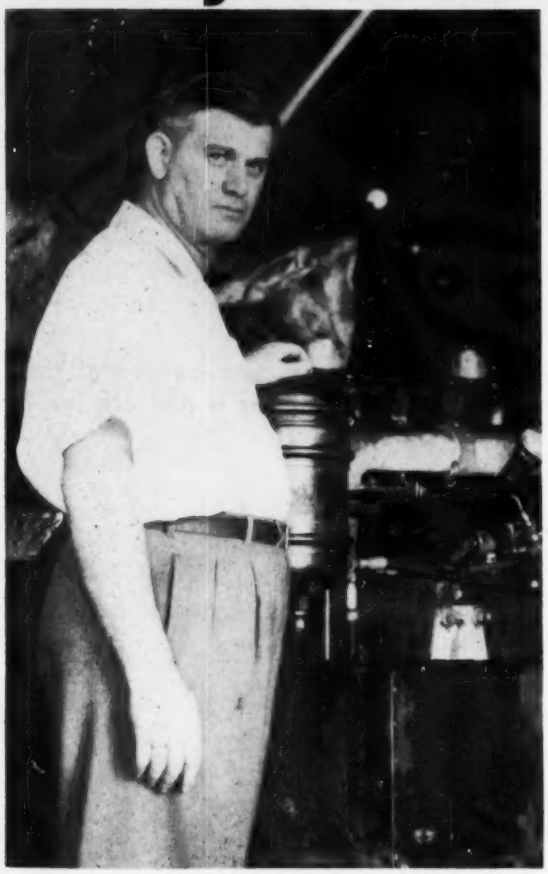
Today's Diesel Man

TEXT AND PHOTOGRAPHS
BY LEONARD F. MAAR JR.



Merle Bogan
Smith's Transfer Corp.

"How important is our maintenance superintendent? Well, sir, maintenance takes a back seat to no other part of our operation. This man's job is to keep our equipment working. We depend on his technical knowledge, on his product knowledge which dictates what we have to get to keep the trucks rolling. As the mainspring in a maintenance department as big and important as ours, Merle Bogan also becomes a mainspring in our business. It would be hard to measure his actual value, but I can tell you that his work has been a major factor in our success."

Russell B. Smith
Vice President in charge of Equipment
Smith's Transfer Corporation
Staunton, Virginia

ABOUT four miles from Woodrow Wilson's birthplace, near Staunton, Virginia is the 23-acre headquarters terminal of Smith's Transfer Corporation. This is one of the most modern facilities of its kind in the South. But even more modern is a management concept that is somewhat unique in the trucking industry. Here at Smith's, the maintenance department is an equal partner with operations. The result is an outstanding performance record.

Two men head up this department, Russell B. Smith, executive vice president in-charge-of equipment and part owner, and Merle Bogan, superintendent of maintenance. Between them, they supervise the care and feeding of some 303 units in all, 210 of which are Mack diesels.

"You won't find many trucking outfits where maintenance is considered as important as operations. It is here. And it accounts for the fact that out of 100 of the Macks with better than 330,000 miles on them, only one has had a major overhaul. Moreover, these tractors do *all* of the work, on *all* of the run. And that run includes city pick-up and delivery in some pretty tough traffic in New York and Boston.

"On top of that, as you probably know, our run into West Virginia takes us over some of the roughest mountain roads in the country," Merle told us.

This is a pretty phenomenal record. What's behind it? What makes Smith's Transfer a stand-out company, one that a good many truckers have used as a model? Management's recognition of the vital role played by maintenance is part of it, but there is more.

The right tools for the job . . .

Physical facilities at Smith's Transfer are just about the last word. The shop, housed in its own specially-designed building, is laid out for maximum efficiency. Contrast this with other truckers where space for maintenance facilities is allocated on a minimum basis, as though it were some kind of necessary evil.

As a matter of fact, there is more space at Smith's than they now need. But tomorrow will be here pretty quick, and the Smith brother's confidence in the future is expressed in the fact that they will be ready to handle an expanded fleet when the time comes. Allowance for growth in planning their shop was carefully considered.

Leaving Merle Bogan's office we began a tour of the terminal. The maintenance building is divided in half by a center island which contains the parts department; a dust-free air-conditioned room in which engine rebuilding and injector work is done; a lounge for service personnel; a shower and locker room and the shop foreman's office. One side of the building is devoted to tractor service repair, the other devoted to trailer service

Russell B. Smith, Executive Vice President
Smith's Transfer Corp., Staunton, Virginia

and repair. Across the back of the building is a tractor wash area; a carpenter shop; machine shop and separate dynamometer room, and a trailer wash area.

Merle gave us a running commentary on the design and function of each area as we went along. The shop is well lit with mercury vapor lamps, quiet, and has an air of calm efficiency. Occasionally the stacatto whine of air starters rises above the busy hum of shop activity. Here are some of Bogan's remarks that hit high points of our tour.

"This room where we do our rebuilding is practically dirt-proof. I happen to believe that more dirt gets put into engines during repair work than you'd ever guess. We take care to prevent this. And you know how important this is with regard to injector work!

"Pumps and governors, specialized work, go to the experts in their field. We use Herb Wittersheim's Diesel Injection Sales & Service, Inc. and know that we can rely on their work. They have been a big help to us.

PM's big part . . .

"I mentioned before that our maintenance program is responsible for our record on the road. PM plays a big part. Step into the shop foreman's office here and I'll show you how it works."

We followed Bogan into the air-conditioned office where foreman ———————— hangs his hat. Neat rows of clip-boards hung along the walls and from work tables at either end of the room both tractor and trailer work is controlled.

"We follow Mack's system because it happens to work best for us. There are many good PM systems, of course, but I'll add a word of caution there in a minute. First, we use Mack's forms. It boils down to careful checks every 4000 miles, each covering a few more necessary points until you get to the 28,000 mile job. That one means the works!

"We wouldn't be getting the kind of performance and mileage out of our diesels if this system didn't work.

"Of course, we think that these are great trucks. Now — for that word about systems. They can eat you alive.

. . . 900,000 pounds of freight move through the Staunton terminal every 24 hours.

I know of a case where an outfit has eight people keeping track of their PM system. They don't do half the business we do and we have half as many people in the office working on our system. In short, they are maintaining a system, we're maintaining trucks!"

Department of parts . . .

George Baylor is the parts man and purchasing agent for Smith's Transfer. This efficient department has been cited in the industry as one of the best. Perpetual inventory is the key. The Kardex system is simple, easy to use. It tells you what is on hand, how much of it, and where it is. With well over $125,000 worth of supplies

. . . it pays to keep track of parts.

Big Macks stand behind the man that keeps them rolling . . .

on hand, it pays to keep track of them.

Merle Bogan works closely with his parts department. He specifies what they are to buy and leaves the actual buying to them. This is where a lot of people get misled in the business. A purchasing agent is a specialist in purchasing, stock and inventory systems. But he often doesn't know beans, for example, which filter element gives the best results. The maintenance superintendent does. He knows because he has watched each type and brand in service.

Smith's business is moving freight . . .

As we walked out through the trailer service side of the maintenance building out toward the big terminal, we could hear the clank of carts being pulled off the towveyor. We watched the work on the floor for awhile and were joined by Al Shiplett, terminal manager. He filled us in on details of freight handling, plus some general information about Smith's operation.

Some 900,000 pounds of goods move through this terminal at Staunton every 24 hours. Diesel tractors haul most of it. In order to maintain this kind of volume equipment has to be working full time. Is it any wonder that maintenance ranks high in this modern trucking business?

At this point, Bogan had to leave and tend to something out in the shop and we had a chance to talk with owner Russell B. Smith. He invited us to join him in his office across the hall where we explained the purpose of this series of articles saluting Today's Diesel Man.

"He's the man. He has the technical knowhow and can pinch-hit right out there on the floor if necessary. He has the intelligence and curiosity to stay ahead of his job. He's a leader. He advises us on purchasing, from trucks, all the way down to filters. You've picked the key man in this business, and I'd say in any of the diesel-powered industries."

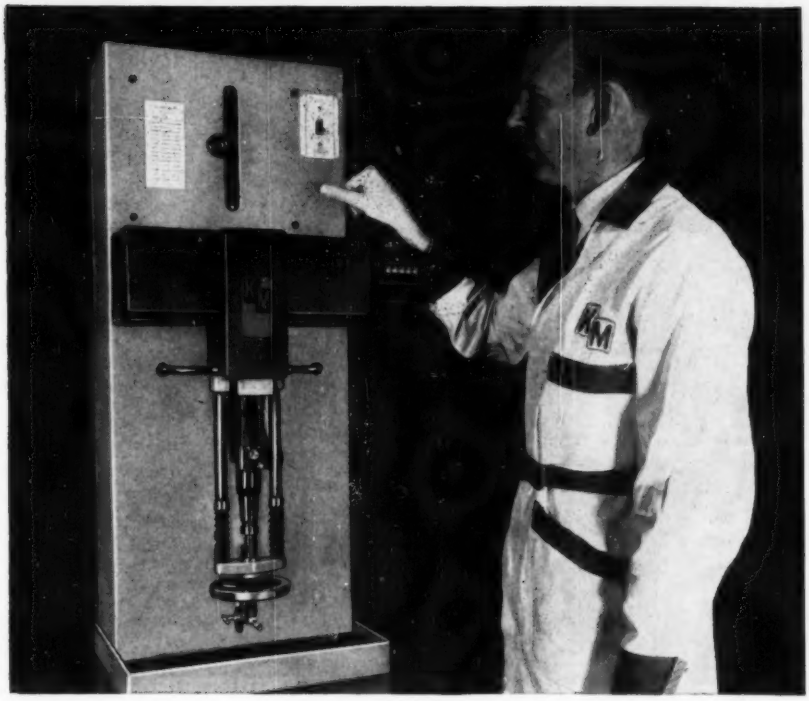
We learned a good deal about how a good trucking business is run during this visit to Smith's Transfer. With this last statement from Mr. Smith, we felt we had the story of another "Today's Diesel Man."

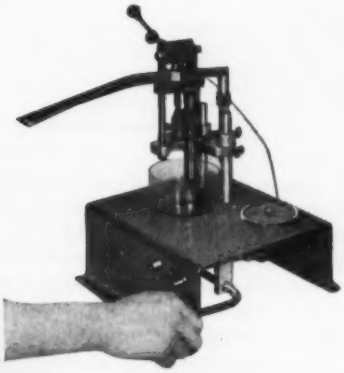
"Our business is moving freight. A tractor can't make you a dime standing out there in the shop. We want them working full time. We believe that our emphasis on maintenance, our democratic approach to running this business, plus good operating procedures, all work toward having the equipment available for maximum work time," Russell B. Smith said, as he joined us back in Merle Bogan's office.

. . . rolling day and night. Service area is always busy readying trucks for the road.

Better Injectors... Lower Cost...

NEW KENT-MOORE SERVICE EQUIPMENT SPEEDS OVERHAUL AND REPAIR OF GM DETROIT DIESEL INJECTORS





INJECTOR TESTER FOR POPPING, SPRAY PATTERN, HIGH AND LOW, AND PRESSURE LEAKS. The redesigned J 7509 Injector Tester used rigid steel tubing to closely regulate the circuit's volume of fluid. Microfilters eliminate dirt, the greatest single element of injector trouble, and a special cam-operated clamp supplies just the exact amount of pressure for perfect sealing during test. The J 7509 Tester will handle both standard body and offset body Series 71 injectors.

ADAPTER KITS. The J 7510 adapter kit is composed of a quick-clamp and support plate designed specifically for standard body Series 110 Injectors. For the offset body Series 110 Injectors, the J 7511 Adapter Kit is used. These parts are installed on the J 7509 Injector Tester in place of the Series 71 unit.

INJECTOR ASSEMBLY FIXTURE. The J 6868 Injector Assembly Fixture provides a quick-clamp fixture to retain the Series 71 Injectors for repair or reassembly. Jaws are available to fit all Detroit Diesel Injectors.

GM Detroit Diesel Injector Comparator Tests performance under simulated operating conditions. Eliminates all guess-work in overhauling and rebuilding injectors to factory specifications. When used with Injector Tester, the condition of all operating parts can be determined. Unnecessary replacement of parts eliminated. With Kent-Moore's J 7041 Diesel Injector Comparator you "road test" GM Injectors right in your shop!

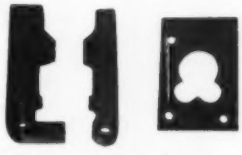
Developed in cooperation with the engine manufacturer, the K-M Injector Comparator measures actual output of new, used or rebuilt injectors by testing them at a fixed speed at a specified number of strokes with filtered fuel supplied at uniform service pressure.

HANDLES ALL SERIES 71 AND 110 INJECTORS

Now you can scientifically test new or rebuilt injectors before building them into the engine—and you can even match-up sets of GM injectors with uniform delivery rates for the best engine performance!

SEND FOR BULLETIN—Write for full data on these and other Kent-Moore special service tools and equipment.

Trade in your old injector tester! K-M Testers purchased within the last three years are worth $75.00 to you! Older models or any make of pump-type testers, bring $25.00 trade-in allowance.



JAWS AND SUPPORT ASSEMBLIES. Jaws and support assemblies are available to adapt the J 6868 Injector Assembly Fixture to handle all the Detroit Diesel Injectors. J 7505 Standard body Series 110, J 7784 Offset body Series 110, J 7506 All Series 51.

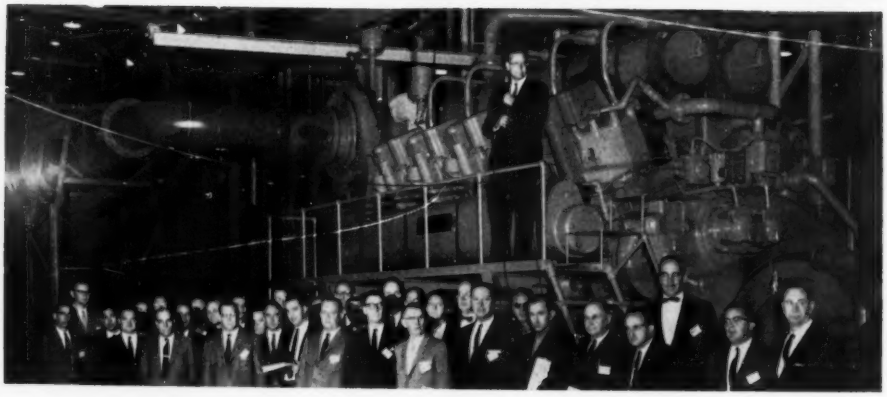
KENT-MOORE ORGANIZATION, INC.

28635 MOUND ROAD, WARREN, MICHIGAN 58-F-6

ENGINEERS AND MANUFACTURERS OF SERVICE TOOLS AND EQUIPMENT

Cool gal, cool car, cool truck . . . Jerry Miller of P.I.E. is showing Susan Bronson, Miss California of 1959, the Mercedes-Benz in his rig. The diesel powers a Thermo King "Imperial" cooling-heating unit. This is the same engine as in the Mercedes 180-D, 4-cyl, 4-cycle, rated 36 bhp for this service. P.I.E. now has 100 of these refrigerated trailers moving everything from plasma to pies. "Cool pie trucks" said Susan. "Coolest thing on wheels," Jerry agreed.

diesel power new products



Pipeline executives, 37 of them, recently witnessed a demonstration of Clark Bros.' new 4000-bhp TPV pipeline engine at the Clark factory at Olean, N. Y. Of 2-cycle design it is also built in 4800 and 6400 bhp models. Engine and a Clark centrifugal compressor will be installed shortly at the Hampshire, Tennessee station of Columbia-Gulf.

MORE NEW PRODUCTS FOLLOW ►

NEW PRODUCTS . . .

Close-Coupled Pump and Motor for Tight Spots

Designed for applications where space andl weight are at a premium, Tuthill has a new unit that measures only 9 1/8-in. by 5-in. It combines an internal gear pump with a capacity from 1/3 to 3 gpm and an electric motor rated for 1/12th to 1/6th hp.

There are 24 models in the series and all can be furnished with or without a built-in relief valve.

Over and Underspeed Governors Now Explosion-Proof

Synchro-Start's versatile GH Series of cable-driven over and underspeed governors has undergone some changes to broaden application. These units with 1, 2 and 3-element speed switches are now contained in an explosion-proof enclosure making them suitable for application in potentially hazardous areas.

This new Series is designated GH-E. Enclosures meet specifications of Class 1, Group D, explosion-proof equipment. Use the Reader Service Card to get Bulletin No. 504A. Also Syncro-Start's engineers will be glad to make recommendations to suit your particular needs.

Automatic Locomotive Refueling by Aeroquip

Aeroquip has come up with an automatic locomotive refueling unit, reportedly three years in the planning, development and testing stage. Three major parts are involved.

Mounted on the side of the fuel tank is a float assembly that when the tank is full, actuates a piston shut-off valve in the locomotive-half of the self-sealing coupling. This coupling half is permanently installed in the locomotive's fuel filler pipe. The fuel nozzle, the other half of the self-sealing coupling, is attached to the hose at fueling areas.

Both halves of the coupling are self-sealing, a big factor in avoiding fuel spillage. Plus this, overfilling spillage is eliminated and time spent in "hand topping" avoided. This automatic fueling unit is compatible with 95% of existing locomotive fueling systems.

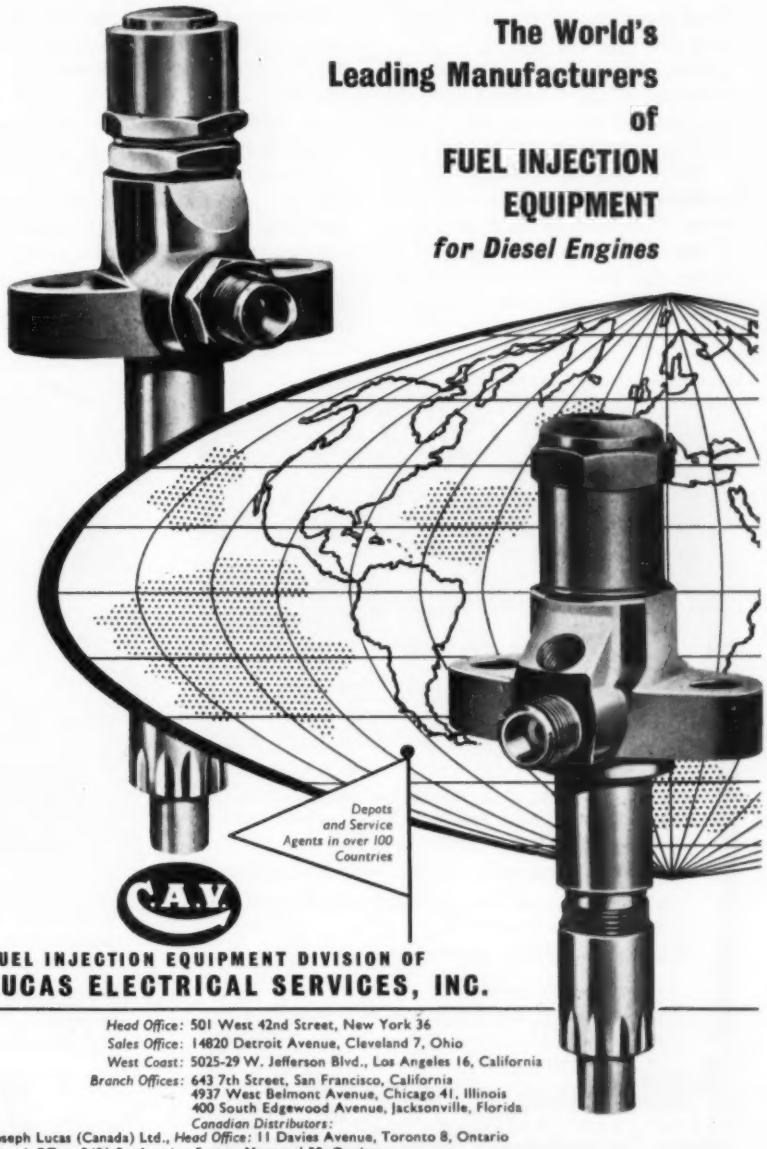
New Purolator Filter Series for High-Pressure Applications

Pneumatic and hydraulic systems, becoming commonplace on modern equipment, need filters just as the diesel does. To meet high-pressure (up to 1000 psi) and temperature (up to 275° F) conditions, Purolator Products has put out their new P-192 Series.

Effective filtration is possible for such fluids as lubricating oils, ethylene glycol mixtures, hydraulic fluids (including mineral oil and diester oil base, silicate esters), fuels, oil plus air and gases. Elements include paper, wire mesh or varied-spacing metal-edge filter media with a filtration range from 2 to 25 microns.

All units come with mounting brackets, inlet and outlet connections and have an internal relief valve to insure bypassing in case of stoppage. Valve settings vary from 15-20 psi for lower differential pressures to 45-55 psi for higher differentials. For suction-side installations, 4-6 psi settings are available.

(More new products follow)



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LUCAS ELECTRICAL SERVICES, INC.

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Sales Office: 14820 Detroit Avenue, Cleveland 7, Ohio
West Coast: 5025-29 W. Jefferson Blvd., Los Angeles 16, California
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4937 West Belmont Avenue, Chicago 41, Illinois
400 South Edgewood Avenue, Jacksonville, Florida
Canadian Distributors:
Joseph Lucas (Canada) Ltd., *Head Office:* 11 Davies Avenue, Toronto 8, Ontario
Branch Office: 3401 St. Antoine Street, Montreal 30, Quebec

AP928

NEW PRODUCTS . . .

Automatic Load Demand System for Low-Output Standby Power

Pacific Mercury has introduced a new control system, the FAC-100, that provides automatic operation of small electrical power plants of up to 4.5-kw. It is a smaller version of their FAC-200 for larger units.

The automatic system goes into action on any load demand—a flipped switch or turned-on motor. When there is no load, the set is shut down. This load demand type of operation with the FAC-100 is said to save up to 50% in fuel and to increase generator life by at least one-third.

When used in conjunction with an automatic line transfer switch, the load demand system can be used to put the set on the line if normal power should fail. In this case the set is started and brought on the line where it remains as long as power is out. When normal power is restored, the control system takes the set off the line and shuts it down.

Finger-Tip Shifting is New Cat Option on DW20 and DW21 Tractors

With new SyncroTouch Transmission control, operators can shift up or down instantly by just dialing a desired gear range. The selector is mounted on top of the control box at the operator's right and at arm level. It replaces the gear shift lever and while the clutch pedal is retained, it is only used when starting from a standstill.

The Cat-designed control was developed specifically for heavy earthmovers. Ability to make quick shifts as grade and terrain change benefits in two ways: first, it helps to get maximum machine production and, second, effortless shifting gives little excuse to stay in improper gear ranges.

In normal operation, complete synchronized shifting takes place in a fraction of a second. All the operator has to do is dial the gear selected; the rest is done automatically. Air pressure engages and disengages the clutch; shifting is hydraulic.

Diesel Ore Carrier for Underground Mining

Latest of a varied line of materials handlers is Getman Brothers' ore carrier approved by the U. S. Bureau of Mines for underground mining in hardrock and metal mines.

Carrier is built on a 104-in. wheelbase and with the standard dump box stands 56-in. high. Load capacity is 85 to 110 cu ft. Turning radius is 11 ft. 6 in.

Power is provided by a Continental diesel and driving through a heavy-duty 4-speed forward, 4-reverse transmission, speeds of up to 15 mph are attained. With the short turning radius, this permits excellent maneuverability in drifts and power for handling its load on steep grades.

I-R NEW HEAVY-DUTY AIR STARTING MOTOR

50% MORE POWER...
USES 30% LESS AIR...
10 LBS. LIGHTER...

SIZE 10 BM Air Starting Motor (for diesel displacement from 400 to 2300 cu. in.—gas or gasoline from 800 to 4600 cu. in.).

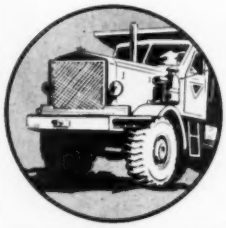
Outperforms all other air starting motors of comparable size. Fully interchangeable with electric starters, with these important advantages:

- faster starting in any weather with no power loss
- eliminates expensive electrical components and costly maintenance
- lighter weight for more payload
- fewer highway repairs

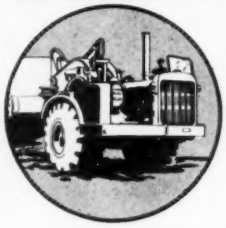
18-921

For details on I-R's complete line of Air Starting Motors send for your copy of "Go-Modern—Start With Air".

Ingersoll-Rand
11 Broadway, New York 4, N. Y.



whatever the diesel-cleaning job, there's a LIX CLEANER



that will do it BETTER . . . FASTER . . . at LOWER COST!

LIX 22 Cleaner, for example, is ideal for cleaning heavy ROAD MACHINERY preparatory to painting. Spray Lix 22 on dirty, oily surfaces and see how quickly dirt and grease roll off. No brushing or rubbing is necessary. Simply rinse with water. Lix cuts cleaning time to a very minimum.

There's a Lix Diesel Cleaner for every purpose—spray, soak-tank, electric equipment cleaners.

Write or phone for literature covering your particular needs.

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300 W. 80TH STREET — DEPT. 30
CORPORATION OF MISSOURI
KANSAS CITY, MISSOURI

diesel power new literature

Data From Allis-Chalmers on Heavy Equipment

A-C's new 16,000 diesel powers the HD-16 crawler tractor described in a new 14-page catalog. You get a full story on this unit, including a big fold-out cutaway view of the HD-16 that hits the important features through marginal notes. In addition to description of the engine's features including its unique combustion system, it covers details such as the track release mechanism and the new hydraulic dozer control unit. Want to know what other equipment matches up with this unit? It's all in this catalog.

Second piece of literature available details the operating, performance and maintenance advantages offered in Allis-Chalmer's HD-16G and HD-21G torque converter-drive tractor shovels. This is an 8-page catalog which hits the production-boosting features of both machines.

You can get copies of these publications through our Readers Service.

Centrifugal Pumps Detailed

This 6-pager from Marine Products Co. has an interesting description of the main design features of the pumps in this line. Taking off from there, you get a rundown on how they work and what they can do. Bronze and iron centrifugal pumps are available from this manufacturer with capacities up to 320 gpm and pressures to 40-psi. Performance data on clockwise, counter clockwise and reversible pumps are included, also specifications and prices. Want the full story? Ask for Centrifugal Pumps Bulletin 1004 on the Readers Service Card.

Non-Sparking, Brushless Synchronous Generators Detailed

Allis-Chalmers has a new bulletin out covering their high-speed, packaged brushless generators in 40 to 300-kw ratings. Key to the new design is a combination of brushless excitation and static voltage regulation control.

These generators are designed for use in engine-generator sets for applications such as in hospitals, mines and quarries, factories, oil well drilling, radio stations, construction projects, marine use, etc. New bulletin "High-Speed Packaged, Brushless Synchronous Generators" will give you the run down.

Engine Power by Cat

In a well-illustrated 16-page booklet, Caterpillar tells its engine power story. High points stressed are the

(*Continued on next Page*)

Makes specifying easy

Contains 24 pages of helpful information on how to select the proper silencer and spark arrestor. Intake and exhaust models available for every industrial, mobile and marine use. Write for your copy now.

Kittell

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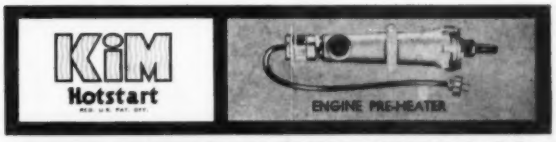
When efficiency is measured in split seconds, "cold starts" must be eliminated. That's why Nike Ajax are now equipped with KIM Hotstart engine pre-heaters. Regardless of weather, they enable operation under full load within seconds. For details on KIM Hotstarts, see your automotive dealer or write us for free literature.



KIM HOTSTART MANUFACTURING CO.
West 917 Broadway Avenue P.O. Box 42 Spokane 10, Washington

NEW LITERATURE . . .

quality, design features, performance and reliability of their products and their manufacturing facilities. The Cat story, told against a background of world-wide operations and a record of continual service, is interesting and impressive. If you are looking for information on power for your operations, you'll want to know what they offer. Here is their story—available to you through our Readers Service Department.

Engineering Fact File Aids In Cooling Tower Selection

J. F. Pritchard & Co. has published an engineering fact file on their Keystone Lo-Line. Design data for these cooling towers was calculated electronically and the manufacturer claims they set a new standard in the field. This publication contains a description of the line plus Keystone capacity tables. The back page is devoted to suggested specifications.

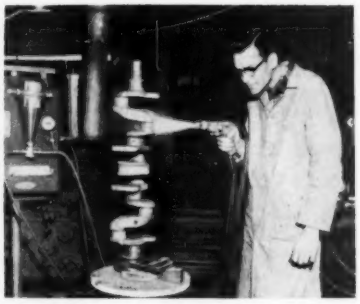
If you are planning a new installation, this Fact File will bring you up to the minute on the Pritchard Lo-Line. It is available through our Readers Service Department.

Gredag All-Weather Lubricants

This little booklet lists 16 grades of Gredag all-weather open-gear lubricants. Product information includes a table of consistency, approximate NLGI numbers, water resistance and additives. Additionally, the booklet provides grade recommendations for outdoor equipment including bearings, cables and wire ropes, dipper sticks, gears and track rollers.

Gredag is cited as being effective against rust and corrosion, non-dripping, thinning and throw-off in service. This all-weather lubricant comes in caulk-type cartridges for easy application.

Engineering Data Sheet on Colmonoy Hard-Facing Alloys



Message this bulletin carries is about Colmonoy's new C-290 crankshaft metal-spray powder for reclamation of worn or undersized crankshafts. In pictures and text, it tells the story of how this hard-facing process is accomplished. The manufacturer claims that Colmonoy C-290 builds high quality crankshaft surfaces faster than ever before, so if you can apply it in your shop, better get this data sheet and look into this new process.

Mechanical Packings Listed

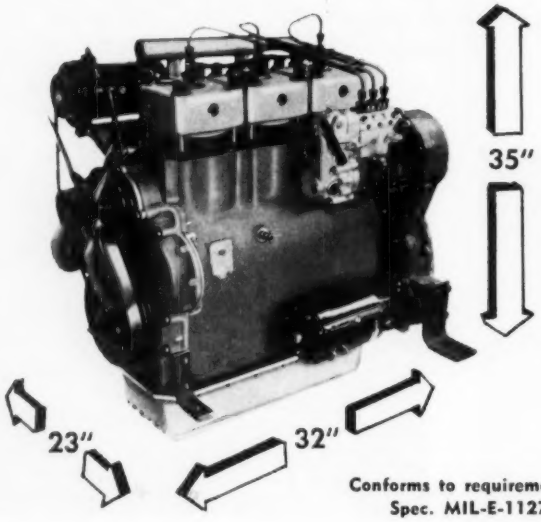
Johns-Manville has a new 64-page catalog out which will give you a lot of good dope on this firm's line of packing for valves, pump glands, etc.

This catalog is really easy to use.

CERLIST DIESEL

MODEL 3

AUTOMOTIVE • INDUSTRIAL • MARINE



Conforms to requirements of Spec. MIL-E-11276

● WEIGHT 600 LBS.

● 85 HP AT 3000 RPM

● 75 HP AT 2800 RPM

● 65 HP AT 2600 RPM

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It makes selecting packing, and understanding the various types and their applications, a breeze. A simplified Packing Selection Chart will help you to relate the most suitable packing construction to your operating conditions.

If you're buying packing, you'll want this publication for your file.

Vapor Phase Flow Diagram Available From Engineering Controls

The prime developer and manufacturer of Vapor Phase engine cooling and waste heat recovery systems, Engineering Controls, Inc., has available a 4-page Flow Diagram describing the operation of Vapor Phase in diesel locomotive applications.

This diagram, showing how engine jacket water is maintained at a high uniform operating temperature, is printed in three colors to show the parts water, steam, lubricating and fuel oil play in the system's operation. For copies of the Vapor Phase Diagram, mark the Readers Service Card accordingly.

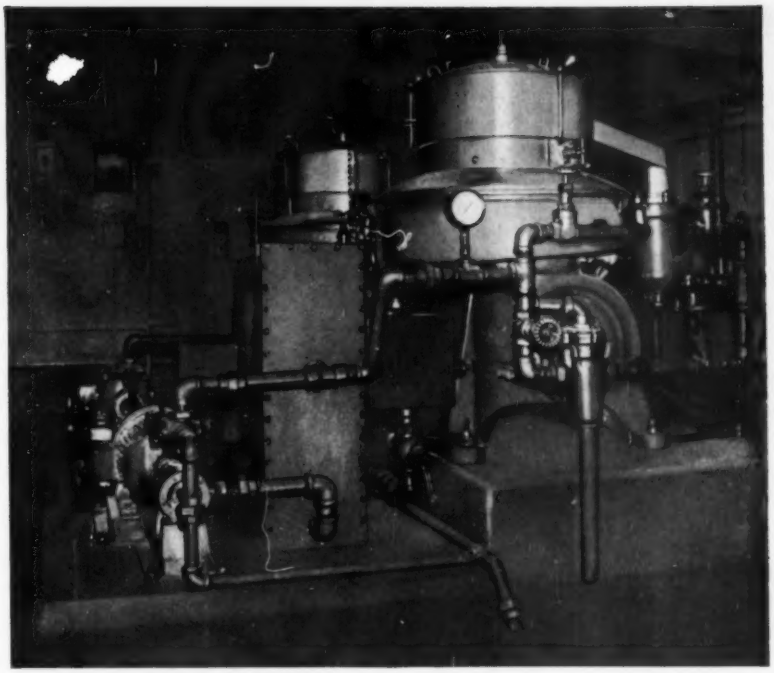
Lenz Line Catalog Published

Photographs and specifications of the complete line of Lenz Tube fittings fill this 20-page catalog. A good feature is the inside back cover listing of all distributors stocking Lenz products.

"Easy-to-find" arrangement makes selection of proper types for each application convenient. Then there is a section on how to order. With over 150 illustrations, this is a ready reference for tube fittings that you'll want to have on tap. Note it on the Reader Service Card for your personal copy.

Movie Available From Euclid On Heavy Equipment

GM's Euclid division has announced the availability of a new 16mm, color sound film. "Power Plus—a matter of perspective" runs 22 minutes. It features Euclid's S-18 scraper, the TC-12 crawler tractor and the all-wheel drive TS-24 "Twin" scraper. It covers design features and applications of the three products. Job footage is shown from various types of applications and from different locations throughout the country.



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* **EASILY DISPOSABLE OIL-FREE SOLIDS**
With the Gravitrol System, only two products are handled—clarified oil and oil-free solids which settle out in the water phase and are consequently "washed free" of oil.

* **HIGH CAPACITY 'ROUND-THE-CLOCK OPERATION**
Continuous self-cleaning operation eliminates costly bowl cleaning and disposal of oil-laden solids.

* **HANDSOME RETURNS FROM RECLAIMED OIL**
The Gravitrol System does a superior purification job, so both the quantity and quality of reclaimed oil is very high.

THE GRAVITROL PURIFICATION SYSTEM IS AN EXCLUSIVE SHARPLES DEVELOPMENT AND ITS EXCEPTIONAL PERFORMANCE MEANS QUICK PAY-OUT AND CONTINUED PROFITABLE OPERATION.

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* *Trademark and patents pending.*

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PEOPLE AND PLANTS

(*Continued from Page* 17)

Houston Co., builders of electrical switch gear and controls, which included attendance at Acton Technical College. He served in aircraft during World War II. Since joining C.A.V., much of his time has been spent in the export end, involving service in foreign countries, for example, 14 months in India. All the time has been in service work.

Mr. Brooks will operate from the New York offices of Lucas Electrical Service, Inc. He will handle service matters with both OEM accounts and with C.A.V.'s distributor organization. Also, he will handle new distributor appointments as conditions require.

ALCO Has New Manager of General Engineering and Development

Hans Schwarz, who has been senior project engineer for ALCO since 1955, has been appointed to the position of manager of general engineering and development in the firm's research and development department. In his new slot, Mr. Schwarz will evaluate and manage programs undertaken by the research and development department.

New VP and General Manager for Fairbanks, Morse Beloit Div.

Gordon R. Anderson has been named Vice President and General Manager of the Beloit Division of Fairbanks, Morse & Co. His last post was as Vice President-Engineering. His new responsibilities will include the production and sales of diesel engines, locomotives, compressors, magnetos and rewind starters. Additionally he will direct the manufacture of large pumps and electrical equipment which will be marketed by other divisions of the company.

Pennington Channelcromium Expands Facilities, Sales Representation

Recent plant expansion and added processing facilities will now permit Pennington Channelcromium Co., San Antonio, Texas, to service a greater diesel market. This company was recently purchased by Electro-Coatings, Inc. with its home office in Des Plaines, Ill.

William J. Suski is in charge of overall sales as well as development of new markets. Five sales representatives will cover a broad area throughout 20 states and Mexico.

Channelcromium-plated liners for diesel and aircraft use have broad governmental approval and are well accepted in the commercial field.

Volney B. Fowler

GM Executive Dies

Volney B. Fowler has passed away. Officially, he was Director of Public Relations for Electro-Motive Division, GM. This title does little to show his long range influence on an important segment of the diesel industry. And it does nothing to describe the respected and well-liked individual so well-known in the diesel industry, particularly in the railroad field.

As the "right hand" of top EMD executives, it would be hard for those who knew him not to believe that his energy, enthusiasm, creativity and sound judgement were factors in the growth and success of the organization. He helped it build from even before the ground-breaking ceremonies at the site of today's EMD La Grange plant.

Courage was one of his qualities. He fought and won several rounds with serious disease, never letting it get him down or lessen the value of his work. As a fine individual and a good friend, he will be missed and remembered by his associates and all others in the industry who had the good fortune to know him.

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SEND NO MONEY NOW

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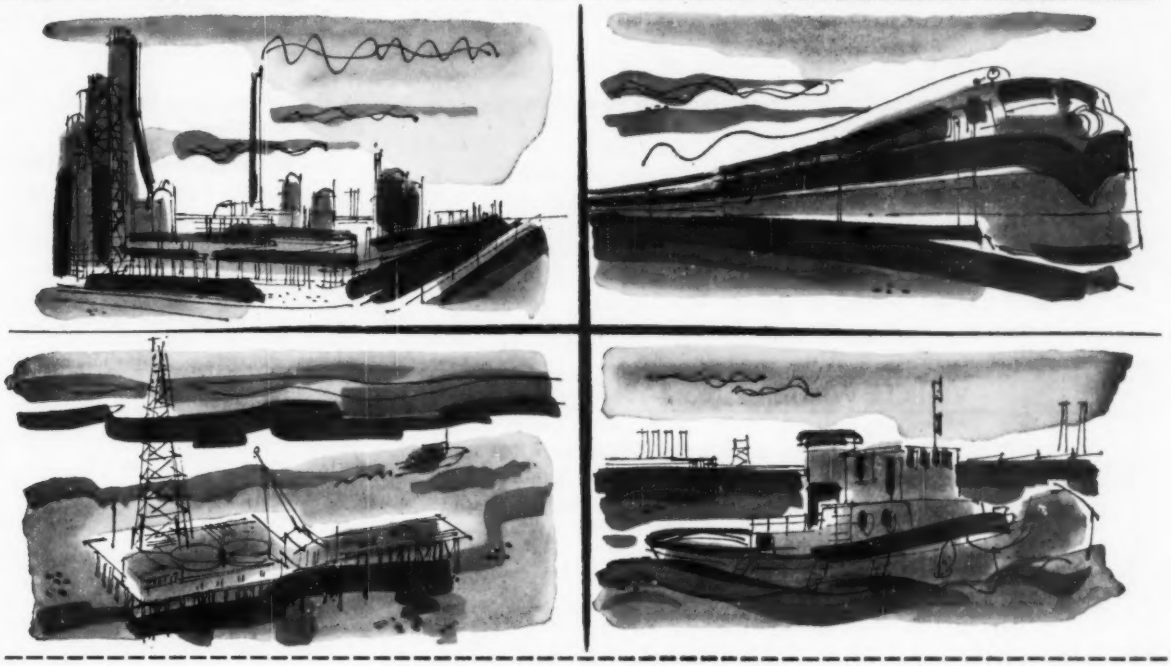
FOR THE LONG RUN . . .



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Since the first diesel engine, Koppers has produced piston rings of predictable performance in a complete range of materials and a wide selection of types and sizes. If you have a ring problem, Koppers can offer you the benefit of their experience. Write to: KOPPERS COMPANY, INC., Piston and Sealing Ring Department, 4410 Hamburg Street, Baltimore 3, Maryland.

Send now for Koppers recommended Piston Ring Set-Ups applicable to the engines which you operate.

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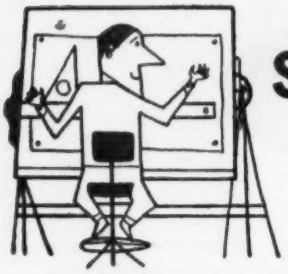


service section

Recent engine and equipment modifications, procedures and recommendations straight from the different manufacturers to you

Winter is here! Did you winterize your equipment in time?

Cold and snow hit early this year in many of the northern states. Wise operators were through with their winterizing programs and feeling good in the knowledge that their equipment would go right on producing through the cold months ahead. In some states, where winter arrives a little later, winterizing is often put off until the last minute. Hit home? Well, if guilty, you better get cracking. Here's a chart from Euclid that will help —

VEHICLE WINTERIZING TABLE

SYSTEM OR COMPONENT	SERVICE PROCEDURE
Cooling System	Drain; flush; check thermostats, hoses, and clamps; refill with fresh anti-freeze solution.
Electrical System	Check batteries, generator, cranking motor, voltage regulator, lights, and wiring. Adjust voltage regulator if needed.
Hydraulic System	Drain, flush, and clean tank and lines. Fill with recommended hydraulic fluid mixture.
Air System	Blow all water from air tank and lines. Install alcohol vaporizor to prevent air-line freeze up.
Fuel System	Drain and flush fuel tank, lines and filters.
Engine	Drain crankcase and refill with recommended lubricant.
Differential & Planetaries	Drain and refill with recommended lubricants of correct viscosity.
Cab	Replace broken glass, check windshield wipers, heaters, defrosters, and repaint where necessary.
Body and Chassis	Remove rust, repair sheet metal and broken welds. Repaint where needed.
Accessories	Check operation of radiator shutters, thermatic fan, and ether starting aid if vehicle is so equipped. Make necessary repairs or replacements.

"Lubrication Time is Inspection Time"

This is the basis of Socony Mobil Oil Company's cost-cutting PM system for construction equipment. A study of many systems showed that an effective system must have four major features. Check these against your system to see how it stacks up.

First, inspection. This has got to be regular, not just now and then. As Socony Mobil points out, lubrication periods are a logical time to do it. Of course, if you don't lubricate regularly, you've had it and no PM system will work.

Second, keep it simple. The easier it is to keep going, the better your chances of making it go.

Third, you need a full case history of the piece of equipment for long-term value of the PM system. What happened a while back can give a clue to the real cause of what happened today.

Fourth, provide for close contact between operator and the maintenance crew. If something happens between periodic inspections, have a workable procedure to get it fixed fast.

How did you come out? Room for improvement? Need forms? Socony Mobil's thought of that too. Five basic forms needed to do the job are available. There's a Record Folder for each piece of equipment. There's space for fuel and lube recommendations and consumption figures; lubrication inspection and service records; special data; and the equipment's history.

Then there's an Equipment Recommendation Chart. Tells lubrication recommendations for each type of equipment; service periods in op-

erating hours; and summer and winter lubricants for engines, gears, etc. This chart stays with the machine.

The Delivery Ticket keeps tabs on all petroleum products delivered to the machine.

A Weekly Service and Inspection Report, filed by service crews lists all service and repairs performed.

Finally, there's the Operator's Squawk Sheet. Requesting repairs and service on a form is a lot better than "Hey, Joe. Fix this for me." Means a permanent record too.

With ready-made PM systems available, there's no excuse for a slipshod, or worse, no PM program.

Start Thinking about Winter Electrical Troubles Now

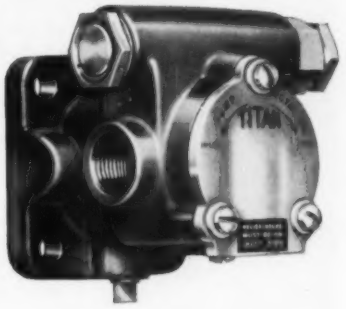
Service suggestions from Delco-Remy Division, GM, serve to remind us that there's a winter coming up. Harder starting and less daylight means more work for the electrical system. Plan now and schedule needed work so as not to be caught short.

Check your charging rate. If the regulator is set right for winter, chances are it has been overcharging the battery all summer. In this case, you've probably been using a lot of water. If the level got below the top of the plates the battery is almost certain to be seriously damaged. Better figure on a new one for the hard winter service.

With a regulator set for summer conditions, you'll run into undercharging. This is at least as serious as overcharging. It means frequent deep cycling (almost complete discharge requiring a recharge) and this damages a battery. Set the regulator to keep the battery well-charged while also meeting the steady load requirements.

Don't forget to examine fan belts. Many electrical components have been blamed for under-charging when it is a loose or worn fan belt. High output generators take some driving power when current loads are high. Slipping belts won't provide it.

BILLION MILE CHAMP



Typical Diesel Pump

Series 5501. Rated capacity: 200 gph. Discharge pressure range up to 20 psi. 11-tooth spline or ¼" square drive tang; rotatable or square mounting flange. Weight with fixed pressure type relief valve: 1.8 lbs.

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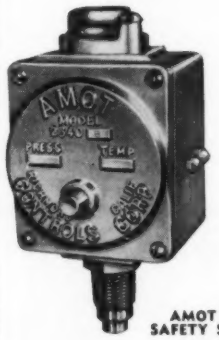
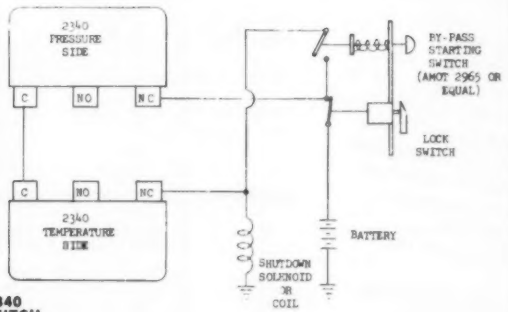


AMOT 2340 SAFETY SWITCH



Positive, reliable protection against costly engine repairs due to burned out bearings and seized pistons is now available to fleet owners and operators of trucks, taxicabs, tractors, off-highway equipment, and industrial power sets.

The AMOT 2340 Safety Switch provides in a single low priced control, protection for expensive engines against the dangers of low oil pressure and high water temperature. It is readily adaptable to any gas engine. Since most truck diesels are already equipped with a solenoid fuel valve, the diesel installation is also simple. For a description and instructions, send for Bulletins 387 and 462.

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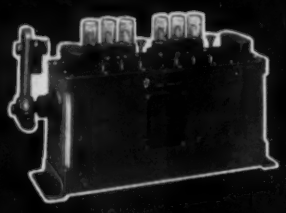

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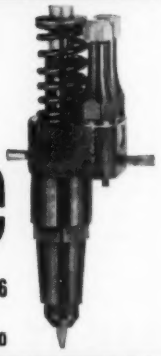

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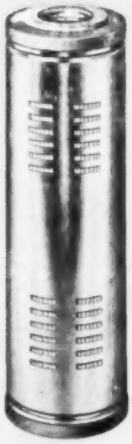

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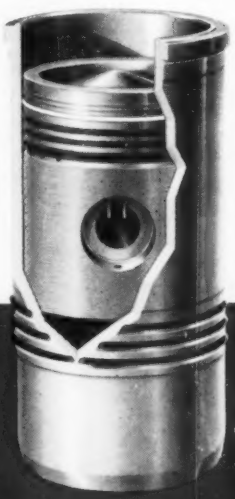

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